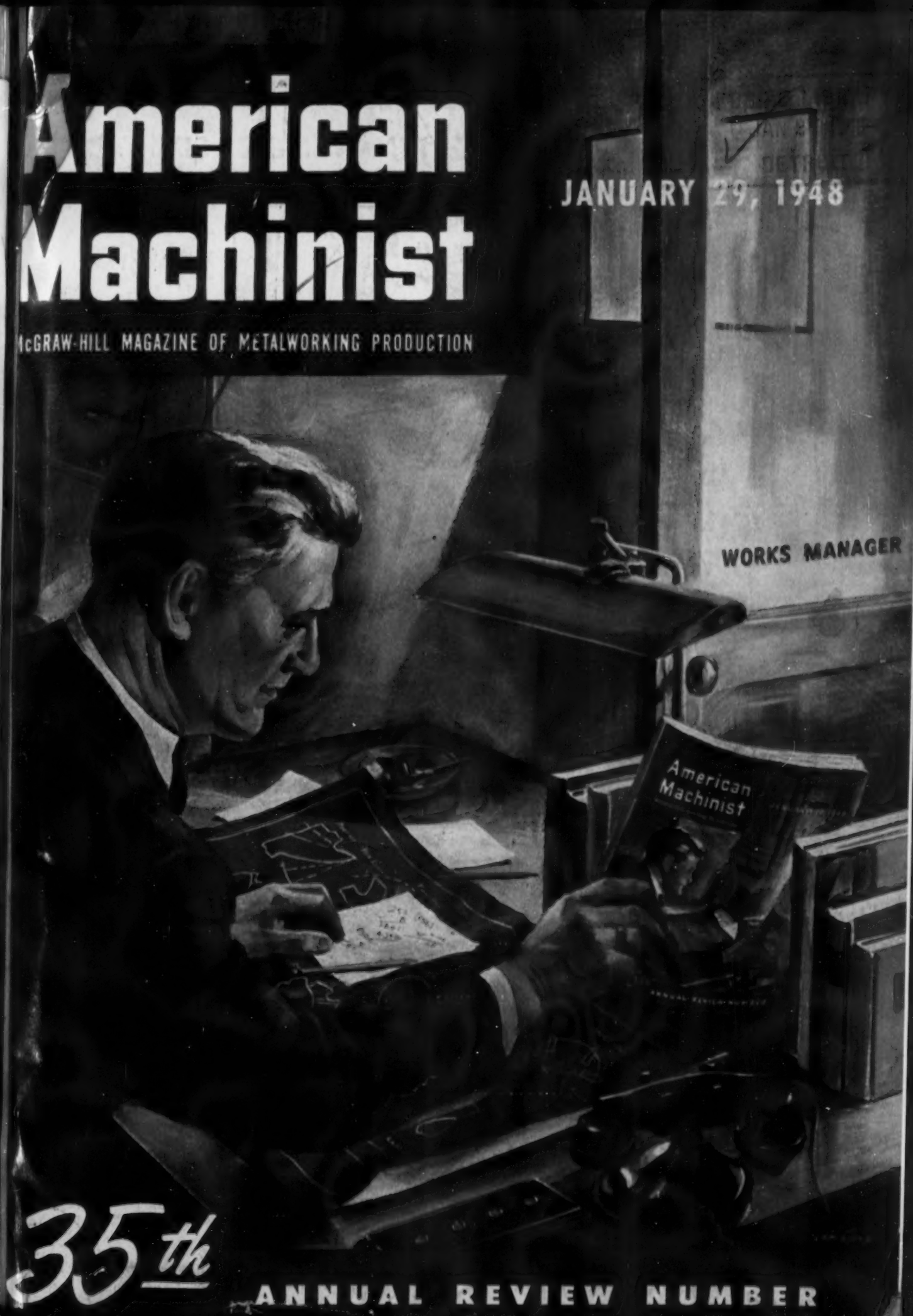
American Machinist

JANUARY 29, 1948

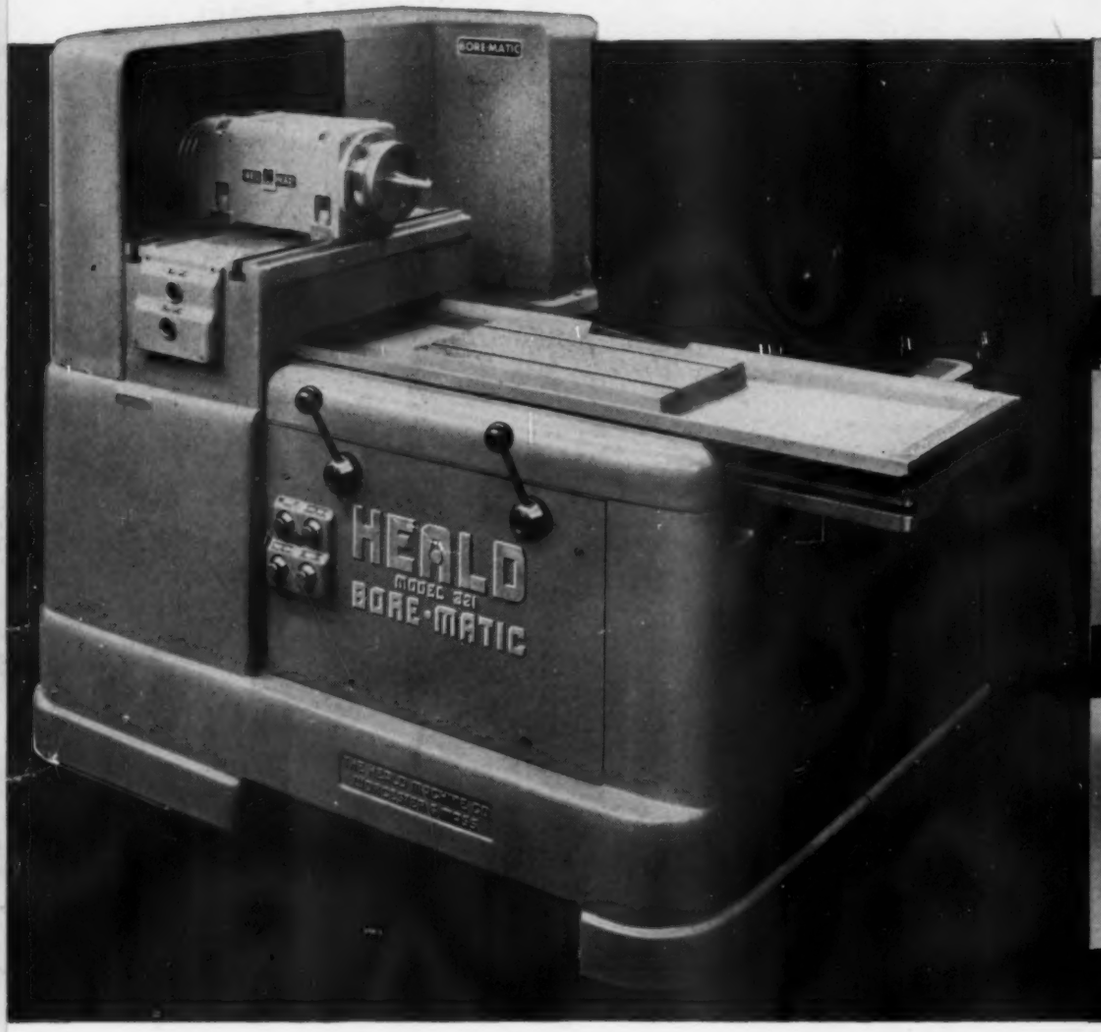
McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION

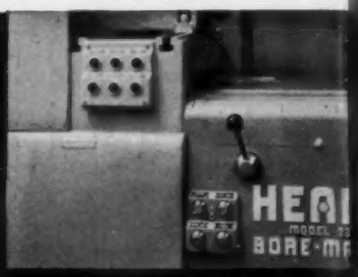


35th ANNUAL REVIEW NUMBER

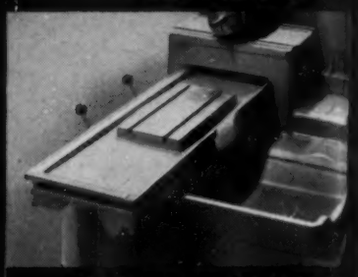
A NEW HEALD BORE-MATIC

FOR MEDIUM TO LARGE SIZE WORK

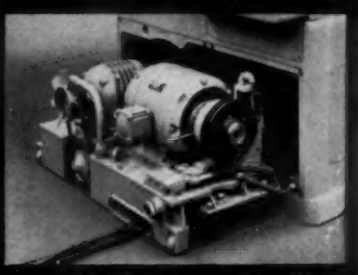




Centralized controls and adjustable table dogs



Large chip pan for chips and cutting fluid



Isolated power unit rolls out from base

Available in two sizes, either as a single-end or double-end machine

HERE IS THE NEW medium-large Heald Bore-Matic—an outstanding addition to your high-speed, mass production machining requirements. Handles a wide variety of work . . . in single or multiple machining operations . . . including rough and finish boring, turning, facing, chamfering, grooving, or fly cutting.

Below are a few important high-production, low-maintenance features of this new Heald Bore-Matic which serve to put it in a class by itself:

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TWO-WAY BORING available with different rates of "in" and "out" feeds by a simple control setting.

These and many other remarkable features make the new Heald Bore-Matic "tops" in production, "tops" in finish, "tops" in accuracy. Get further information at the Heald branch office nearest you, or write:

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TECHNOLOGY DEPARTMENT

American Machinist

MAGAZINE OF METALWORKING PRODUCTION

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(35th Annual Review Number)

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Chips and QUIPS

Our Cover ... The gentleman on the cover, a blend of two other people by Theodore Van Gorp of the McGraw-Hill Graphic Arts staff, suggests an idea for you. He obviously is keeping and using this issue as a desk handbook of equipment, materials and supplies. Probably you, as do so many other readers, keep it handy, so this is just a reminder. The gentleman reaching for the copy of A.M. on which is the same gent reaching for the same mag., and so on, *ad infinitum*, is, by the way, an old advertising trick made famous on "Old Dutch Cleanser" scouring powder cans years ago.

Index ... For many years, metalworking executives have sought a business index in their own field which would be more accurate for their own planning than any of the general business indices. For one reason or another, no comprehensive index could be developed—units, dollars and shipments all showed faults as bases. Now, however, after a couple of years of testing and trying, the McGraw-Hill Department of Economics has developed one for us, based on manhours worked. We introduce it to you in this issue, will keep it up to date hereafter. Your suggestions for improving it will be welcomed.

Daffynitions ... A year or two ago, we published a series of peculiar definitions. Among those we've seen since that stuck are these: Inflation—the butcher's thumb at a dollar a pound. Timekeeper—a clockeyed man. Durable goods—those that last longer than the time payments. Critic—a man who goes along for deride. Flaming youth—he keeps the home sires burning.

Review ... This is by far the largest of any annual review of equipment, parts and materials we've ever published—about 1500 items. At this writing, it will occupy like 168 pages, also a record. The major factor in its tremendous size, of course, the Machine Tool Show and the more than 300 new machine tools introduced there. The result, however, is something like 215 editorial pages—almost three times normal content—and in a 3-issue month at that. Here's a prime and up-to-date catalog.

Statistics ... In addition to the new Index of Metalworking, we present in this issue our second Statistical Summary—a 16-page digest of the important statistics of Metalworking.

Devil vs. Deep Blue . . . Periodically, we receive a "puff" picture or article, with a veiled demand that we publish it—for advertising considerations. To put it bluntly—we won't. That puts us between the Devil and the deep blue sea. We like advertising—it pays our salaries. But we've learned that advertising, at least in *American Machinist*, is not won, *and kept*, by publishing puffs; it's kept by serving our readers.

Sure, one little "puff" among 50 or 60 items in an issue would scarcely be noticed, and it would make one advertiser very happy. But you wouldn't try to sneak one rotten apple into a bushel of good ones, because it would promptly infect the whole pack. So we'll stay between the Devil and the deep blue sea; we know you can't beat the Devil at a bargain, but a lot of people have learned to swim.

Starter ... In one Nicholson File booklet is the statement, "The best and fairest test of the value of a file is its efficiency per $1 of payroll." Study that one—it applies wherever men work by the hour, with today's spiralling costs per manhour. And it isn't limited to files.

Coming ... Feb. 12 A.M. will begin a 2-part series on heat-treating tiny parts, end Zino's 7-part series on hydraulic oils. There'll also be an explanation by John Gaillard of ASA of the gage-zone system that can save real money, pointers from Walter France of Scovill on cold-heading brass wire, some shop shots from the West Coast, articles on drillpress fixtures and pneumatic feeds. Our special report will be on metal-to-wood adhesives. All of which is in truth (remembering Abe Lincoln's birthday) a fact-packed package.

ENGINETTE . . . Wartime brought many changes, not the least of which was the great number of women who entered industry and those who chose engineering as a profession. When Dean Hammond of Pennsylvania State College first wrote us of Eileen J. P. Ershler, we saw in his letter a chance to see what a woman engineer-editor could be like. Here's our test case.

Miss Ershler has her bachelor of science in industrial engineering from Penn State, following grammar-school training in Weehawken, N. J. She was also elected editor of the *Penn State Engineer* against stiff male competition, and made a notable job of it. During vacations, she worked as a draftsman and in the cost department of Ershler & Krukin, Inc., Bayonne, N. J., her father's metalworking plant.

A UNIT OF GEAR CUTTING MACHINERY WITH A COMPLETELY NEW GENERATOR

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SPIRAL BEVEL,
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The Gleason No. 2 Hypoid Generator . . . faster cutting . . . superior tooth bearing . . . production quantities or small jobs . . . closer control of actual cutting . . . heading a unit of equipment for the smooth production of bevel gears and hypoids for small tools and appliances.

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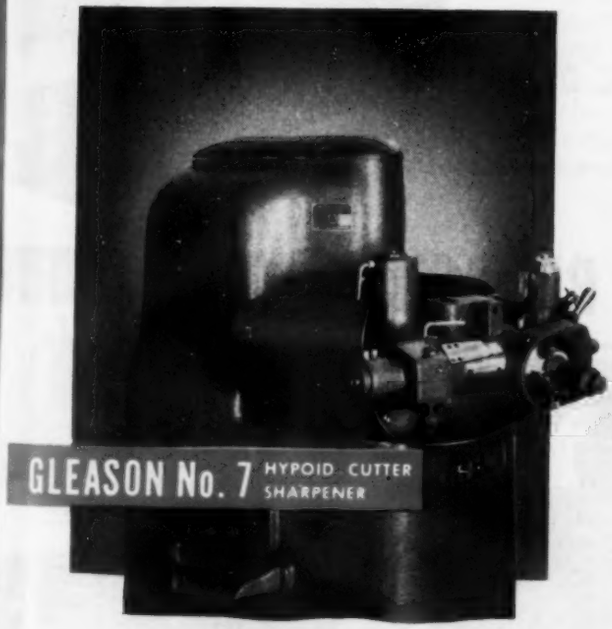
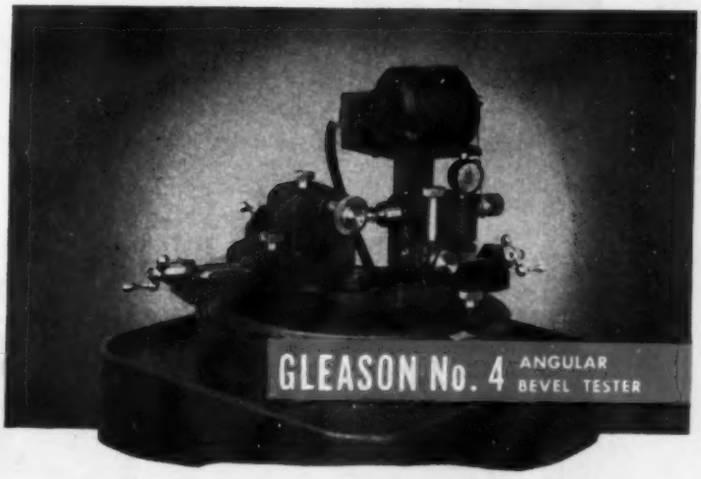


GLEASON No. 7 HYPOID CUTTER SHARPENER



GLEASON No. 4 ANGULAR BEVEL TESTER

The Gleason No. 4 Angular Bevel Tester . . . employed to check the rolling qualities, tooth spacing and concentricity of the cut gears.

The Gleason No. 7 Hypoid Cutter Sharpener . . used for the sharpening of the multi-blade circular cutters used in the No. 2 Hypoid Generator.

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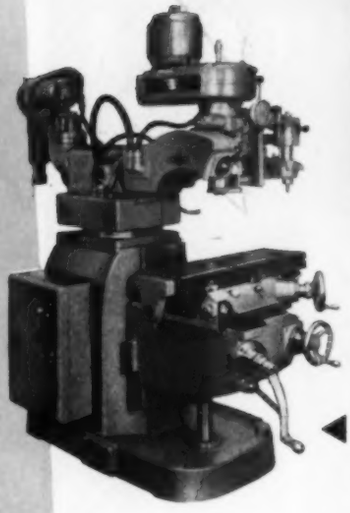
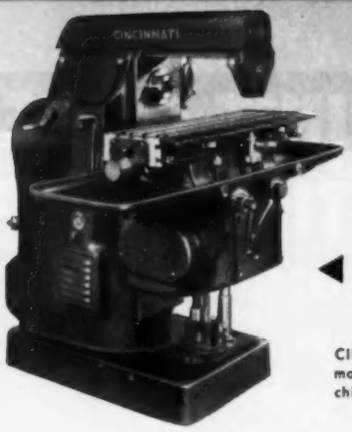
Rochester 3, N.Y., U.S.A.

Builders of Bevel Gear Machinery for Over Eighty Years



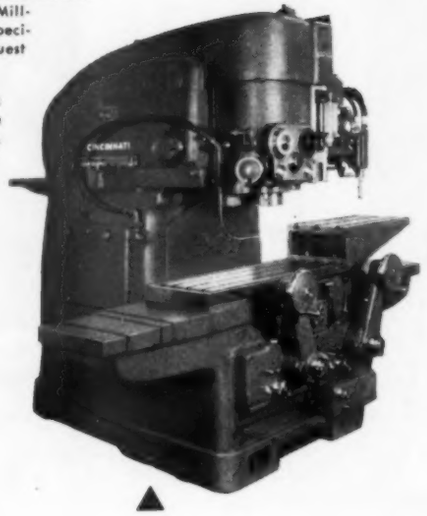
CINCINNATI No. 2-24 Duplex Automatic Milling Machine. Specifications on request

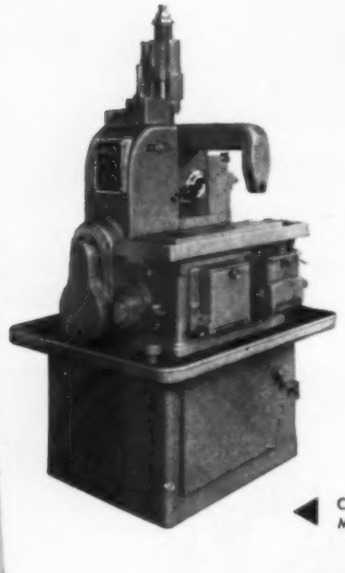


CINCINNATI No. 18 Plain Automatic Milling Machine. Catalog M-1555

CINCINNATI No. 0 matic Unit Type M chine. Catalog M-16

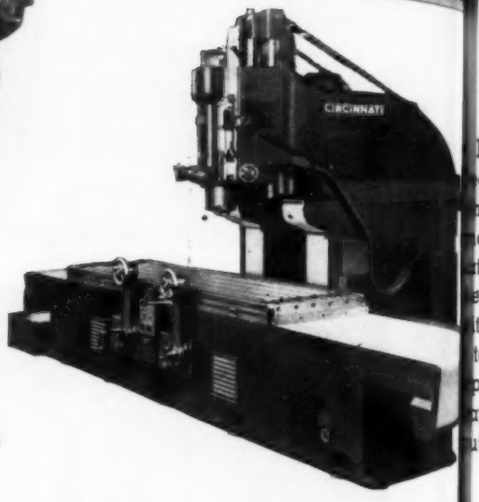
CINCINNATI 8" x 18" Tool and Die Milling Machine. Catalog M-1620.





CINCINNATI 16" Vertical Hydro-Tel Milling Machine. Catalog M-1497.

CINCINNATI 28" Vertical Hydro-Tel Milling Machine. Catalog M-1284-1.

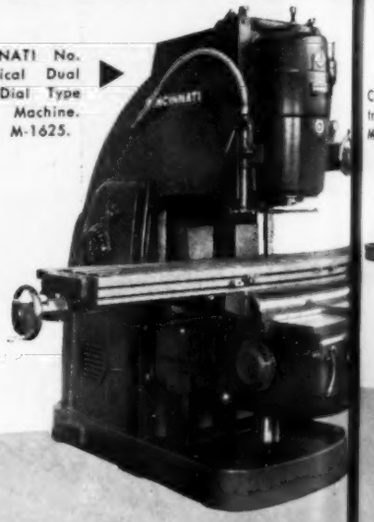


CINCINNATI No. 0-8 Automatic Rise and Fall Milling Machine Catalog M-1607

CUT YOUR MILLING, BROACHING AND CUTTI

CINCINNATI Plain Dial Type Milling Machine. Catalog M-1623.

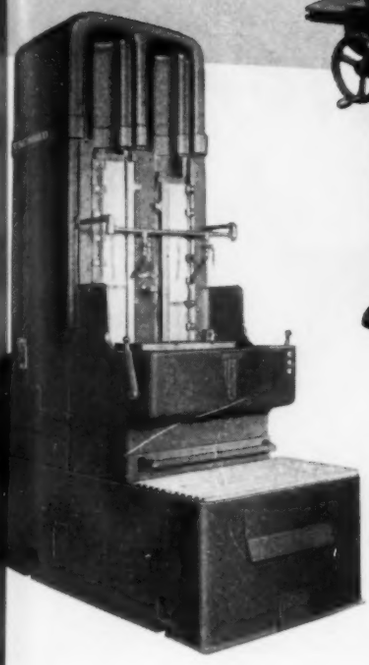
CINCINNATI No. 5 Vertical Dual Power Dial Type Milling Machine. Catalog M-1625.



CINCINNATI No. 2 MI Plain Milling Machine. Catalog M-1506-1

THE CINCINNATI MILLING

MILLING MACHINES



CINCINNATI Duplex (double ram) Vertical Hydro-Broach Machine. Catalog M-1387-1

CINCINNATI No. 2 Cutter and Tool Grinder Catalog M-1618.

CINCINNATI Monoset Cutter and Tool Grinder Catalog M-1591

CINCINNATI Projecto-Form Grinding Machine. Catalog M-1612.

How did you like those shopping tours last ecember? Well, you don't have to go shop- ng for the right milling, surface broaching d cutter sharpening machines, for Cincin- ti Milling has them all under one roof. Thir- en sizes and types of knee-type millers— th CINCINNATI DYNAPOISE overarm—from to 50 hp, and up to 60" table travel. Bed pe and automatic millers, up to 90" table avel. Several sizes of diesinking machines; tomatic profilers; rise and fall millers; tracer controlled millers. For higher production shops, 13 sizes of vertical and horizontal surface broaching machines. And to keep cutters sharp, the No. 2, Monoset and contour cutter and tool grinders. You may obtain complete information on the machine in which you are interested by writing for the catalog numbers indicated.

UTT ARPENING COSTS - with these

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CINCINNATI Tracer Controlled Hydromatic Milling Machine. Catalog M-1602.

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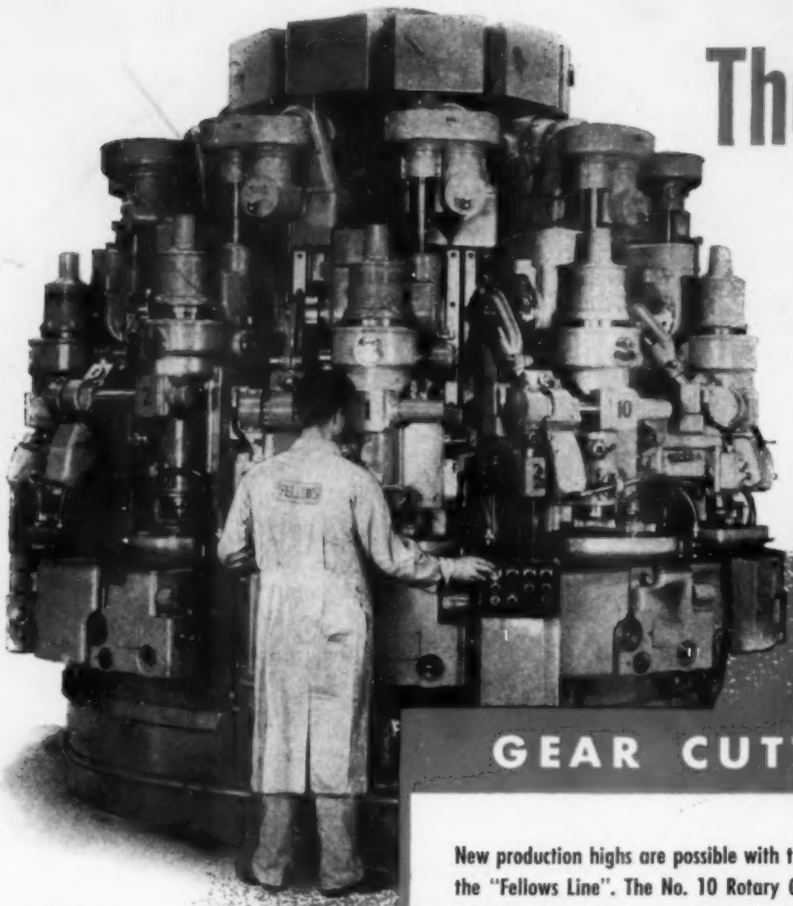
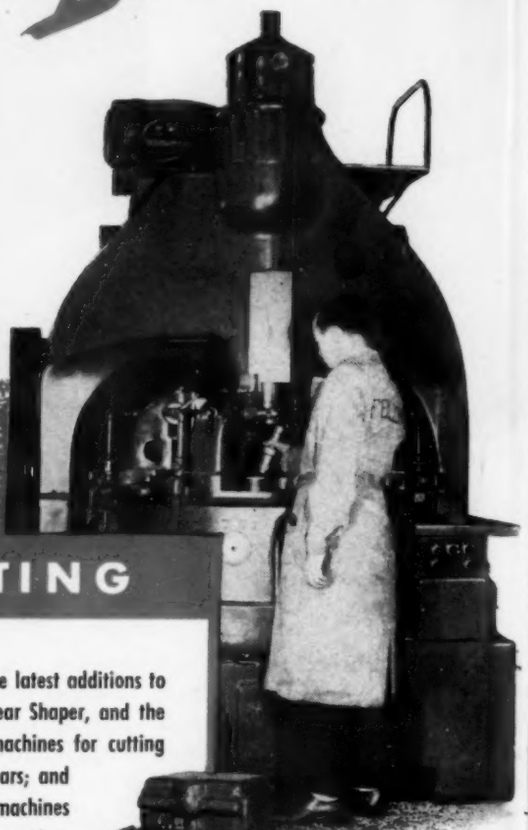
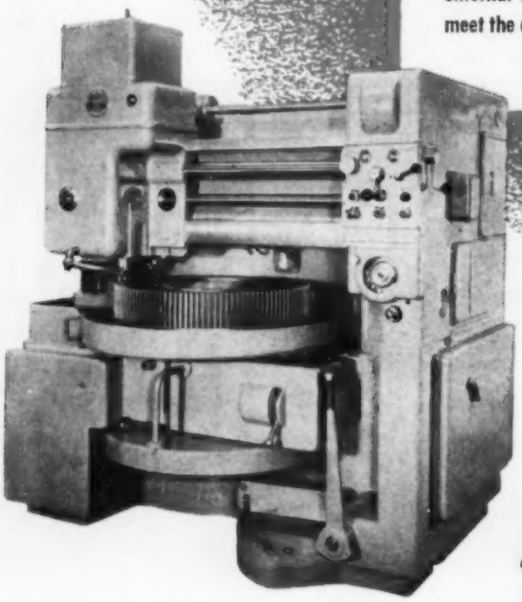




GEAR CUTTING

New production highs are possible with the latest additions to the "Fellows Line". The No. 10 Rotary Gear Shaper, and the Planetary Gear Shaper are companion machines for cutting external and internal spur and helical gears; and external spur and helical pinions. Other machines meet the demands for general-purpose gear cutting.

The No. 10 Rotary Gear Shaper, a heavy-duty ten-unit machine for cutting external and internal spur and helical gears.



The 36-Inch Gear Shaper, a general-purpose machine for cutting all types of gears, cams, splines and special profiles.

The Planetary Gear Shaper, a multi-station machine for cutting external spur and helical gears and pinions.

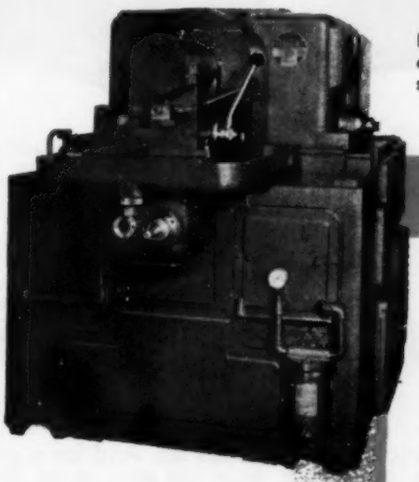
The 3-Inch Fine-Pitch Gear Shaper for small gears pinions, etc.

Fellows

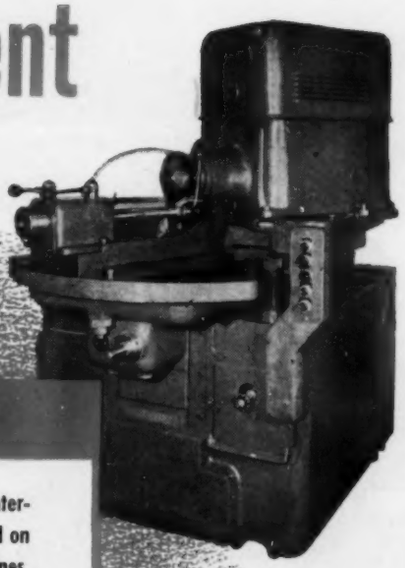
THE FELLOWS GEAR SHAPER COMPANY
Head Office & Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Bldg., Detroit 2 • 640 West Town Office Bldg., Chicago 12 • 7706 Empire State Bldg., New York 1

GEAR SHAPERS • THREAD GENERATORS • CUTTERS • SHAVING AND BURNISHING MACHINES

Gear Production Equipment



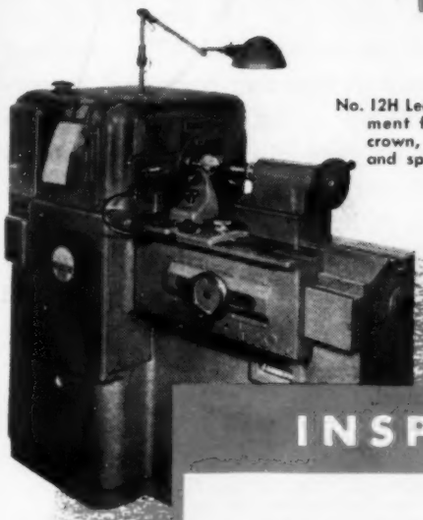
No. 11 Internal Gear Shaving Machine for the finishing of internal spur and helical gears.



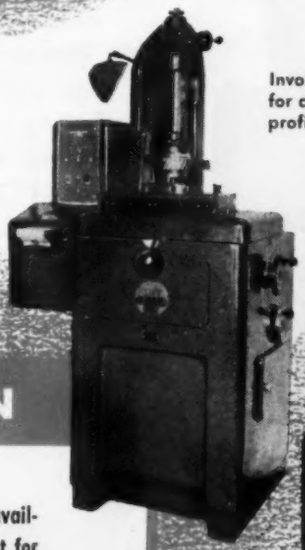
No. 8 Full-tool Gear Shaving Machine for the finishing of external spur and helical gears on a high-production basis.

SHAVING

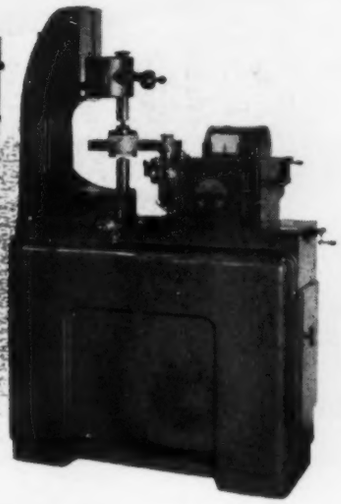
The rapid and accurate finishing of external and internal spur and helical gears can now be accomplished on two distinct types of Fellows Gear Shaving Machines. The No. 8 Full-tool Gear Shaving Machine employs a new method for the accurate and rapid finishing of external spur and helical gear. The No. 11 Internal Gear Shaving Machine employs another method for finishing internal spur and helical gears.



No. 12H Lead Measuring Instrument for checking lead, crown, and taper of helical and spur gear teeth.



Involute Measuring Instrument for checking involute gear-tooth profiles.



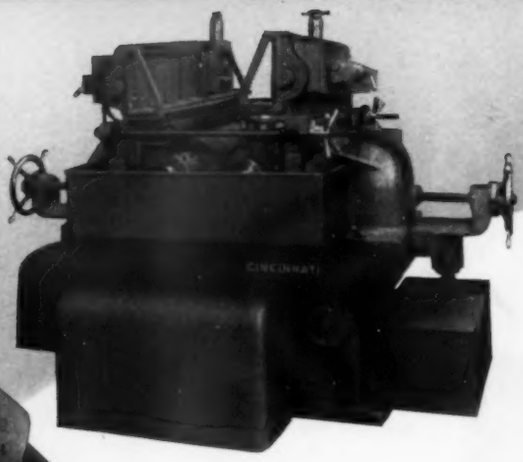
The Red Liner for checking all errors in combination.

INSPECTION

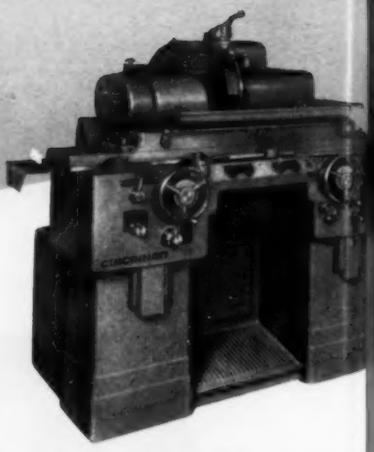
A complete line of inspection equipment is also available including: The Involute Measuring Instrument for the accurate checking and charting of involute profiles. The Lead Measuring Instrument for checking and charting lead, taper and crowning of spur and helical gears; and the Red Liner for final checking and charting of all errors in combination.

Literature is available on all the machines illustrated, and for a complete layout of Fellows gear production equipment ask for a copy of our general catalogue, "Fellows Machines, Cutters and Tools".

GEAR MEASURING AND INSPECTION INSTRUMENTS · PLASTICS MOLDING MACHINES

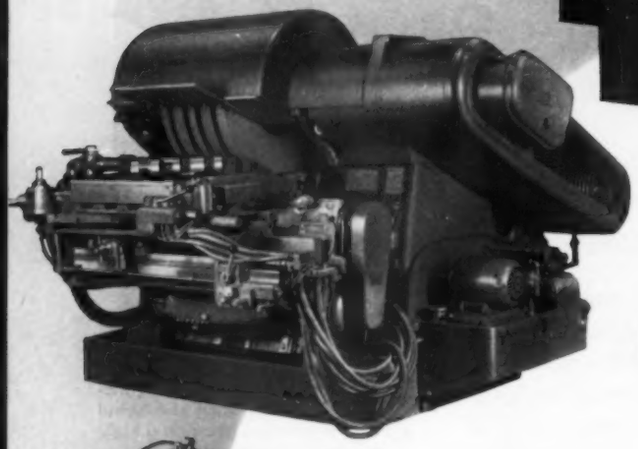


Above: CINCINNATI FILMATIC Centerless Lapping Machine. Specifications on request.



Above: CINCINNATI FILMATIC 4" Plain Hydraulic Grinding Machine. Built in 12" and 18" lengths. Catalog G-551.

Below: CINCINNATI FILMATIC No. 5 Centerless Grinding Machine. Specifications on request.



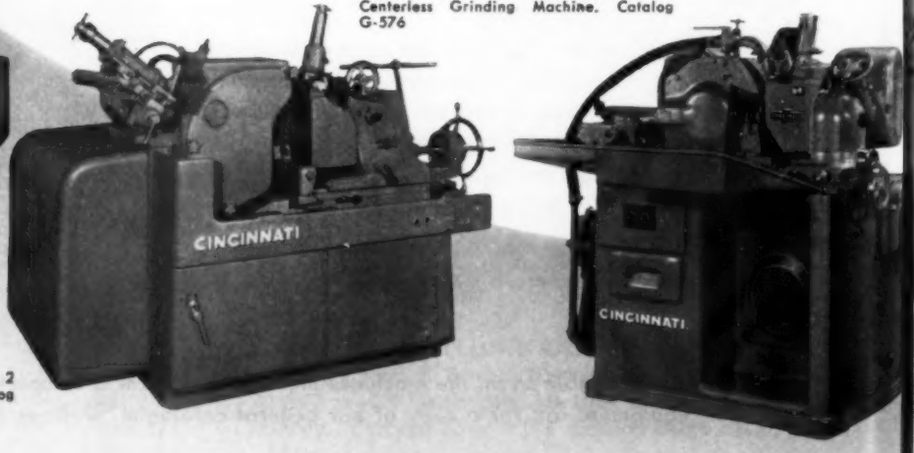
CUT YOUR GRINDING C

Left: CINCINNATI FILMATIC No. 4 Centerless Grinding Machine. Catalog G-538.

Men don't change much, but machines do. And for a good reason. The latest design machine tools offer you the possibility of reducing costs below what you considered the irreducible minimum a few years ago. ¶In the field of precision cylindrical grinding, CINCINNATI FILMATIC Grinding Machines can be a big help in lowering costs and improving quality. They are available in an exceptionally wide variety of sizes and styles: six sizes of centerless; centerless lapping; Micro-centric; chucking; centertype and roll grinders from 4" to 60" swing; up to 75 hp. All of them are equipped with FILMATIC Grinding Wheel Spindle Bearings, a favorite of grinding men everywhere. Some of these machines are illustrated here. You may obtain complete information on those in which you are interested by writing for the catalog numbers indicated.

Above: CINCINNATI FILMATIC No. 3 Centerless Grinding Machine. Catalog G-570.

Right: CINCINNATI FILMATIC No. 0 Centerless Grinding Machine. Catalog G-576



Right: CINCINNATI FILMATIC No. 2 Centerless Grinding Machine. Catalog G-574.

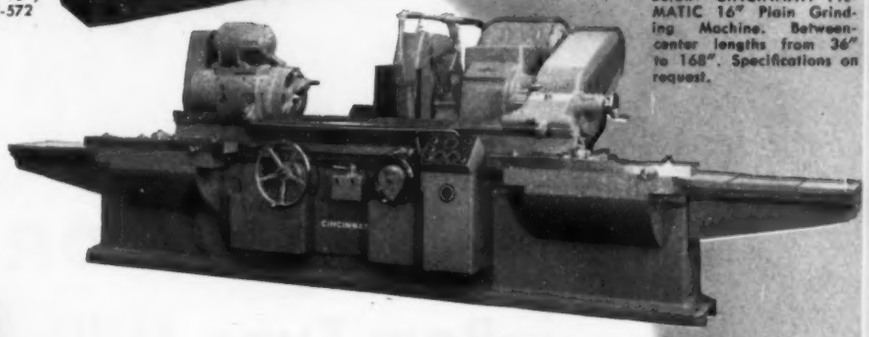
CINCINNATI GRINDERS

CENTER TYPE GRINDING MACHINES

Left: CINCINNATI FILMATIC 6" Plain Hydraulic Grinder. Also available in 10"-L size and between-center lengths 18" and 30" Catalog G-566.

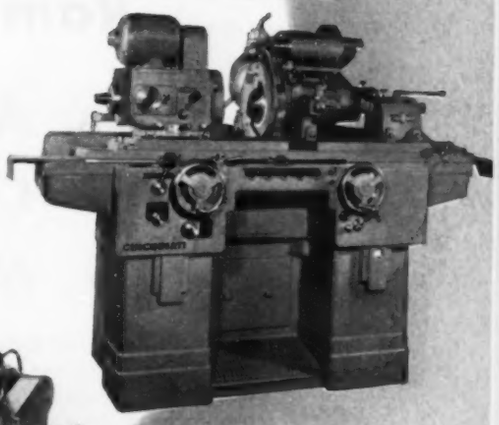
Right: CINCINNATI FILMATIC 10" Plain Hydraulic Grinder. Also available in 14"-L size. Between-center lengths 18", 36", 48", 72" and 96" Catalog G-572

Below: CINCINNATI FILMATIC 16" Plain Grinding Machine. Between-center lengths from 36" to 168". Specifications on request.

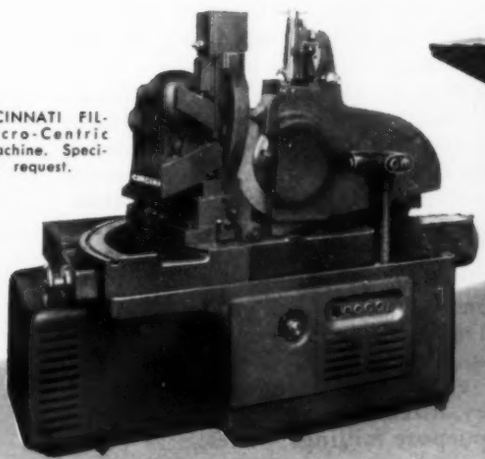


...G COSTS with these CINCINNATI FILMATIC GRINDERS

Right: CINCINNATI FILMATIC 10" Hydraulic Universal Grinding Machine. Catalog G-577



Left: CINCINNATI FILMATIC 12" Hydraulic Universal Grinder. Also available in 14", 16" and 18" sizes, between-center lengths 36", 48" and 72" Catalogs G-486-4 and G-474-3.



...H: CINCINNATI FILMATIC Micro-Centric ...inding Machine. Specifications on request.

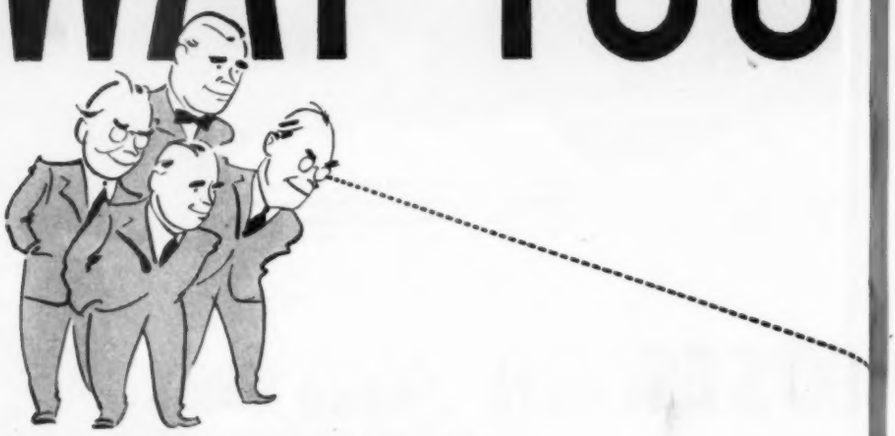
CINCINNATI

INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES

ANY WAY YOU



VAN NORMAN

Ram Type Milling Machines

★ **Are Easy to Operate**

★ **Cut Down Idle Time**

★ **Multiply Machine Output**

From any point of view, management, production, or operator . . . Van Norman Ram Type Millers meet every milling requirement from accurate work to maximum production and economy.

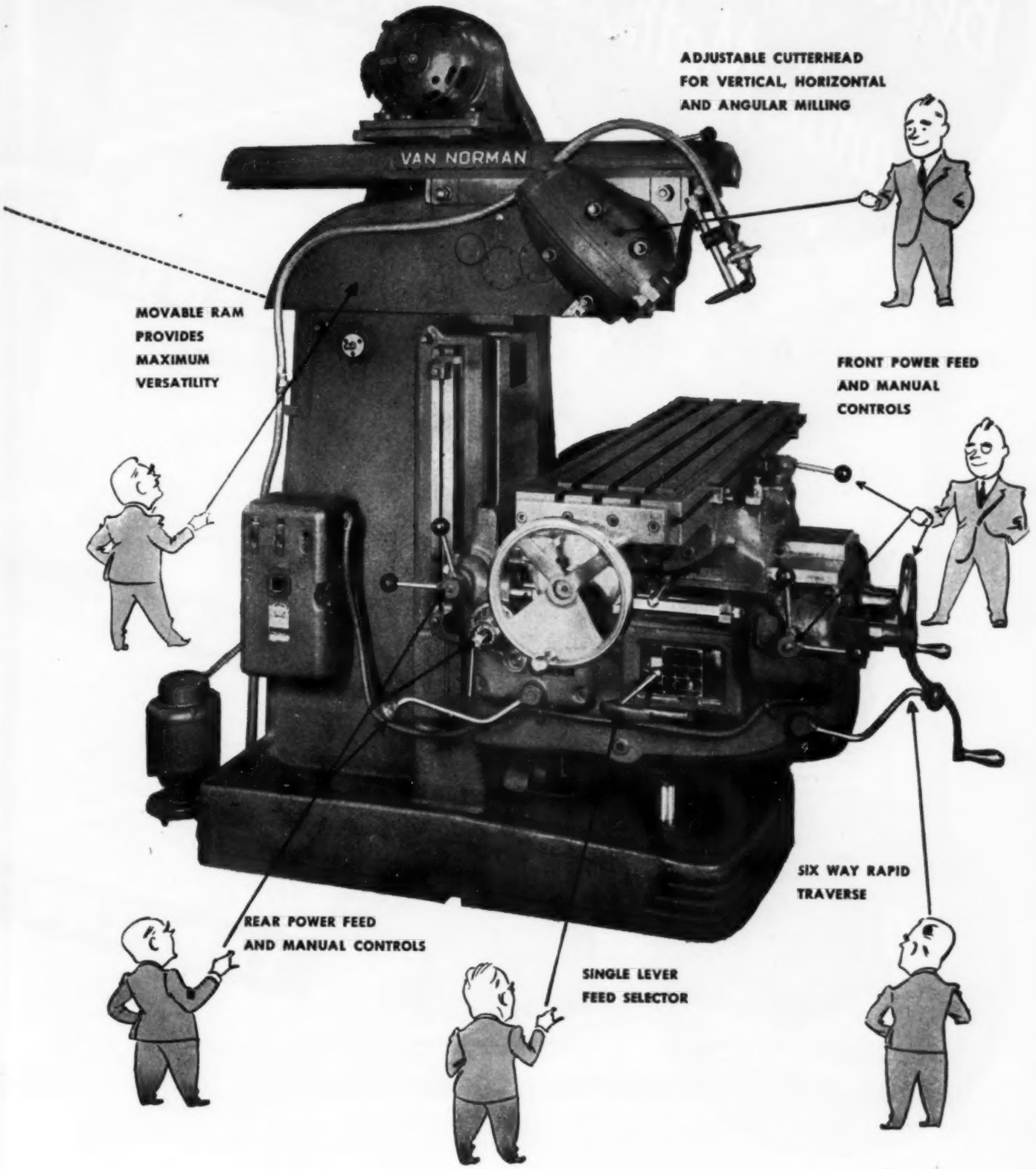
- *Adjustable Cutterhead* permits conventional horizontal and vertical as well as angular milling all on one machine . . . minimizes work setups . . . cuts idle machine time. In addition, this versatility enables you to meet job to job milling requirements.
- *Increased Range* — the adjustable cutterhead and movable ram provide maximum milling capacity and versatility.
- *Front and Rear Finger-tip Controls* of all power feeds, six way rapid traverse and hand adjustments provide extreme ease of control . . . reduce worker fatigue . . . increase output. Power controls operate in the desired table, saddle and knee movement assuring maximum simplicity of operation.
- *Single Lever Feed Selector* provides quick, easy selection of the proper feed for the type of work being milled. 18 feeds are instantly available from front or rear operating position.
- *Long Life Accuracy* is assured by precision Van Norman construction. Hardened alloy steel gears and multi-splined shafts operate on anti-friction bearings . . . automatic lubrication assures thorough oiling of all moving parts . . . massive knee, saddle and table assemblies provide rigidity.

Investigate Van Norman Ram Type Millers today. They are available in many models and sizes, with plain or universal saddles, to meet every requirement for toolroom, laboratory, machine shop, pattern shop, and general purpose milling.

VAN NORMAN COMPANY
Springfield 7, Massachusetts

"It pays to Van Normanize"

LOOK AT IT...

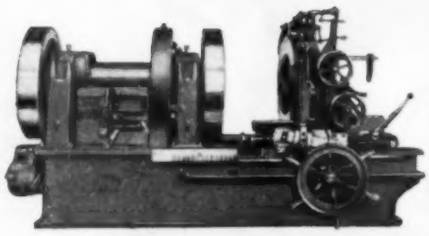

VAN NORMAN
ADJUSTABLE CUTTERHEAD FOR VERTICAL, HORIZONTAL AND ANGULAR MILLING
MOVABLE RAM PROVIDES MAXIMUM VERSATILITY
FRONT POWER FEED AND MANUAL CONTROLS
SIX WAY RAPID TRAVERSE
REAR POWER FEED AND MANUAL CONTROLS
SINGLE LEVER FEED SELECTOR

Better Threads by Landis Methods

LANDIS

CUTTING

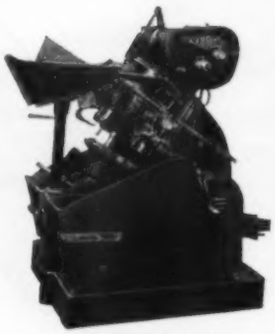
Bolt and Pipe Threading Machines. Threading Heads for Turret Lathes and Automatic Screw Machines. Equipment designed either for high production work or for jobbing and maintenance operations. An important feature of this equipment is that it uses the Landis Tangential Chaser, whose free cutting action has often caused it to be acclaimed "The Finest Thread Cutting Tool in Industry."



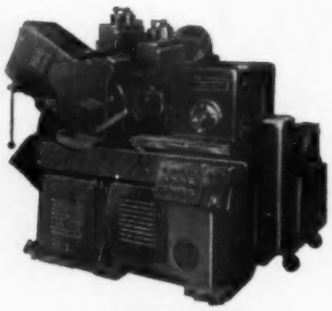
PIPE THREADING & CUTTING-OFF MACHINE

GRINDING

The Centerless Thread Grinder for grinding screw threads on straight cylindrical workpieces and headed or multiple diameter parts by either the thru-feed or in-feed methods. It can be used for grinding threads from the solid as well as for finish grinding of precut threads, the choice of method being determined by the workpiece and thread specifications.



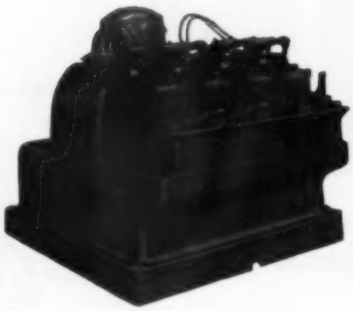
AUTOMATIC FORMING & THREADING MACHINE



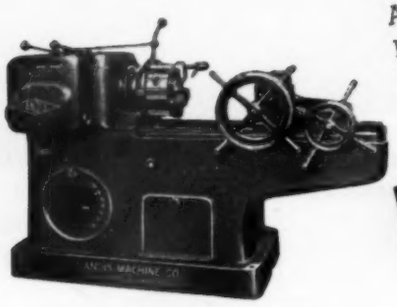
CENTERLESS THREAD GRINDER

ROLLING

A fast and economical method of generating screw threads. The Landis roll Attachment, for producing straight threads, is designed for Automatic Screw Machines. It provides for processing threads which would otherwise have to be handled as a secondary operation.



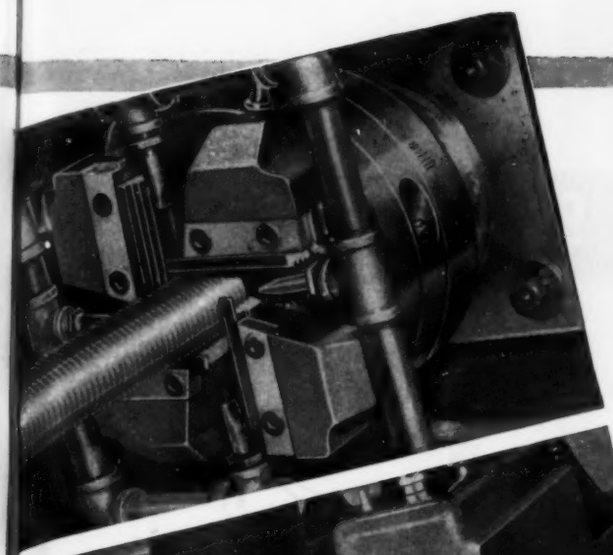
4-SPINDLE SEMI-AUTOMATIC

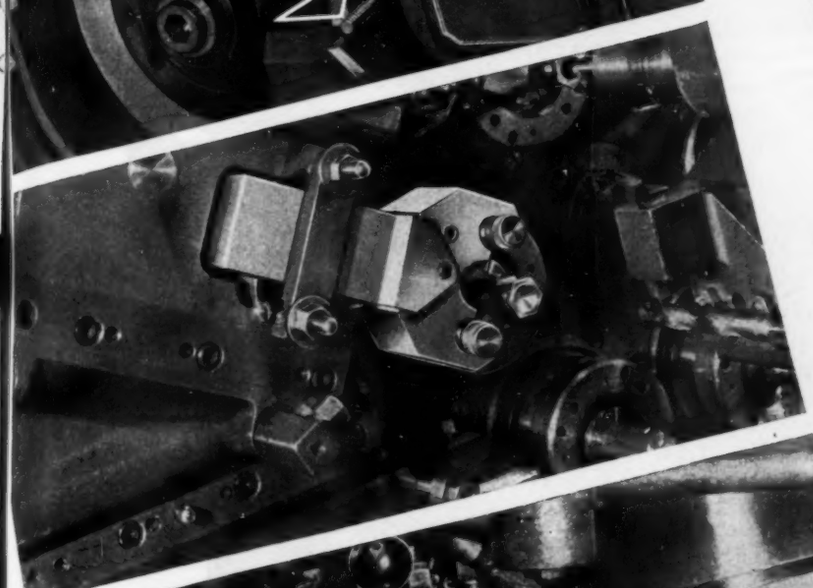


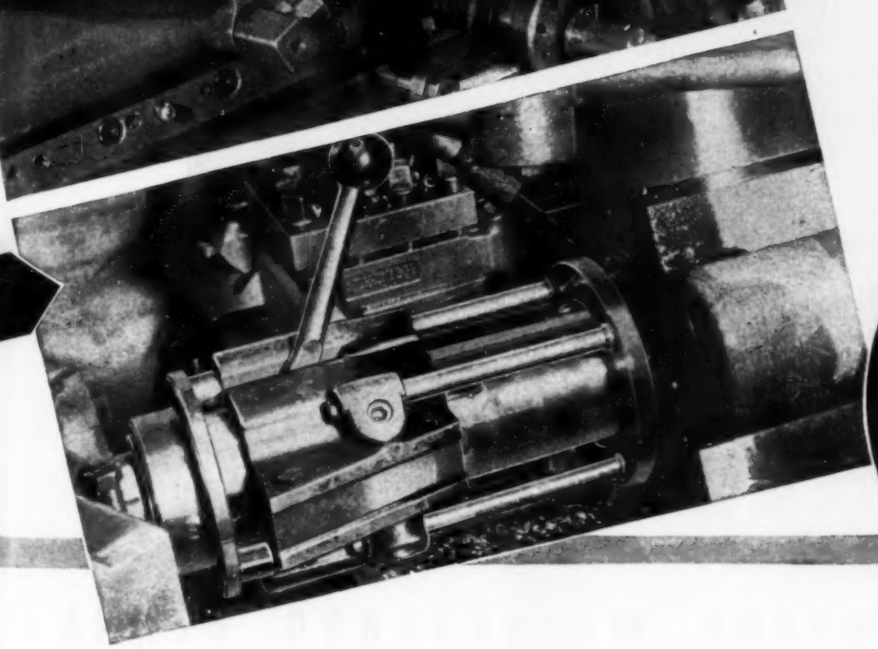
LANDMACO THREADING MACHINE

TAPPING

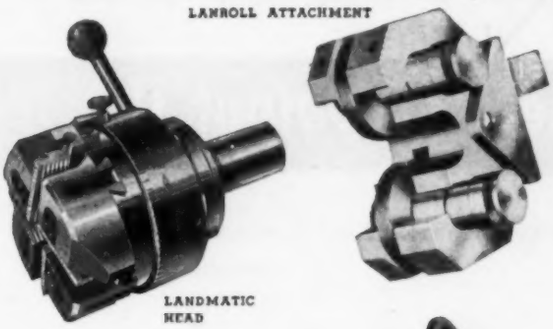
Collapsible and Solid Adjustable Taps for tapping straight and tapered threads—held within National Screw Thread and API tolerances.





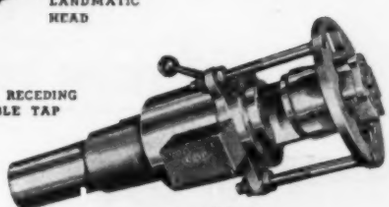


LANROLL ATTACHMENT

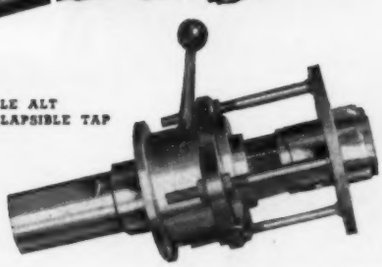


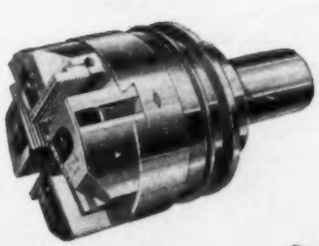
LANDMATIC HEAD

STYLE LL RECEDING COLLAPSIBLE TAP



STYLE ALT COLLAPSIBLE TAP





LANDEX HEAD

THE LANDIS CHASER

LANDIS Machine COMPANY
WAYNESBORO
PENNA., U.S.A.

Operator Output Up 37% Scrap Cut 25%

LANDIS TOOL COMPANY, WAYNESBORO, PENNA.

A large electrical manufacturer who purchased three Landis Tool 10" x 20" Hydraulic Universal grinders for tool room work reported a 37% increase in output and 25% reduction in scrap over a previous machine.

in Tool Room Grinding

Here are some of the features of design that give such performance:

increased output

- Controls grouped for operator convenience.
- Rapid setup for various jobs with graduated swiveling headstock, wheelbase and swivel table, plus combination live and dead spindle headstock.
- Speeds adjustable for maximum output—adjustable speed headstock motor drive and adjustable speed hydraulic table traverse.

reduced scrap

- MICROSPHERE wheel spindle bearings permit closer work tolerances because exact bearing clearance is adjustable.
- Dynamic balance of rotating parts eliminates vibration of rotating parts and assures fine unmarred finishes.
- Hydraulic control permits more exact tolerances because you are free of jarring at reversal or end of cycle.

You may have an entirely different grinding problem. However, you will find the same features that make possible large output and close tolerances on the more than 200 types of grinders produced by Landis Tool.

Our engineers will be glad to assist you with your grinding problem. For more information on this machine request bulletin I 145. 65

optional features

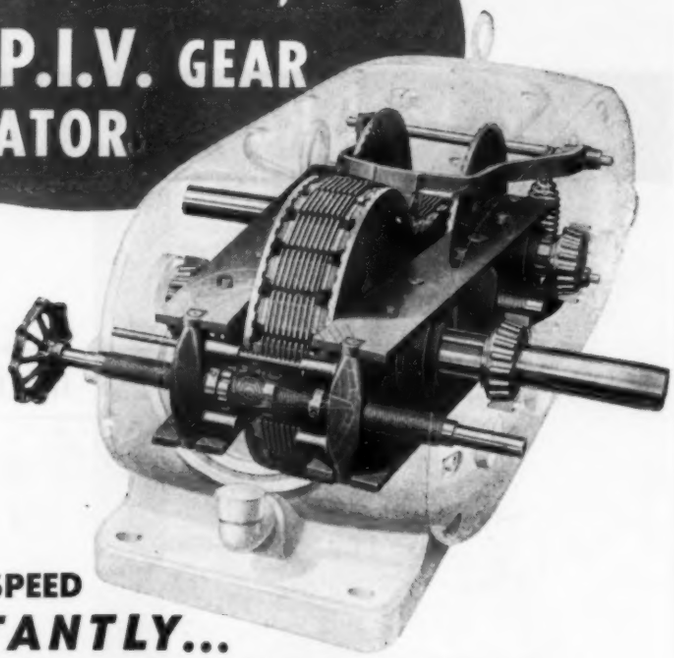
Rotary Magnetic Chuck
Collett Chuck
Double End Wheel Mounting
Wheel Balancing Arbor

standard equipment

Combination Live & Dead Spindle Headstock
Face Plate for Live Spindle Grinding
Water Service
Two Work Rests
Removable Bracket Type Internal Fixture
6" 4 jaw Independent Chuck

LANDIS TOOL
Precision Grinders

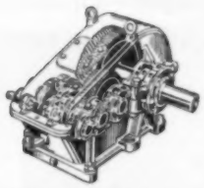
MODERNIZE DRIVES *for Exact Speed* WITH LINK-BELT P.I.V. GEAR SPEED VARIATOR



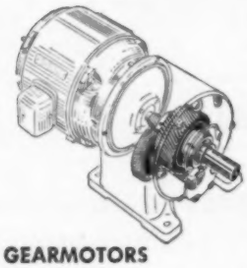
LINK-BELT POWER TRANSMISSION MACHINERY SERVES ALL INDUSTRY

SILVERSTREAK SILENT CHAIN DRIVES

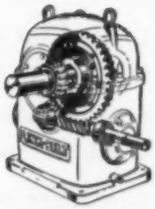
SILVERLINK ROLLER CHAIN DRIVES



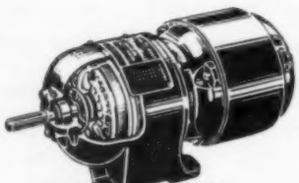
HERRINGBONE GEAR SPEED REDUCERS



GEARMOTORS



WORM GEAR SPEED REDUCERS

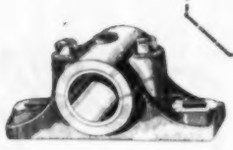


ELECTROFLUID DRIVES

BALL BEARING MOUNTED UNITS

UNMOUNTED BALL AND ROLLER BEARING UNITS

ROLLER BEARING MOUNTED UNITS



BABBITTED BEARINGS

GET ANY SPEED *INSTANTLY...*

MAINTAIN IT ACCURATELY *with this* POSITIVE, INFINITELY VARIABLE *Speed Changing Unit*

In any process where precise speed is a factor in quality, costs, efficiency or profits, the P. I. V. Gear speed variator supplies the ideal drive. With this unit, power is transmitted through an all-metal chain, making tooth-to-tooth contact with metal wheels. Within wide limits this unique, self-contained unit enables you to vary the speed of a driven machine to a minute fraction of a revolution per minute. Once selected, the chosen speed is maintained indefinitely, without slip or creep. Speed is changed while the drive is running by a small hand wheel, or by automatic or remote control.

Built for vertical or horizontal mounting, plain or motorized, and with or without enclosed reduction gears. From ½ to 15 h.p. and ratios up to 6:1. Get book 1874 for full details.

LINK-BELT COMPANY

THE LEADING MANUFACTURER OF CONVEYING AND MECHANICAL POWER TRANSMISSION MACHINERY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities. 10,737

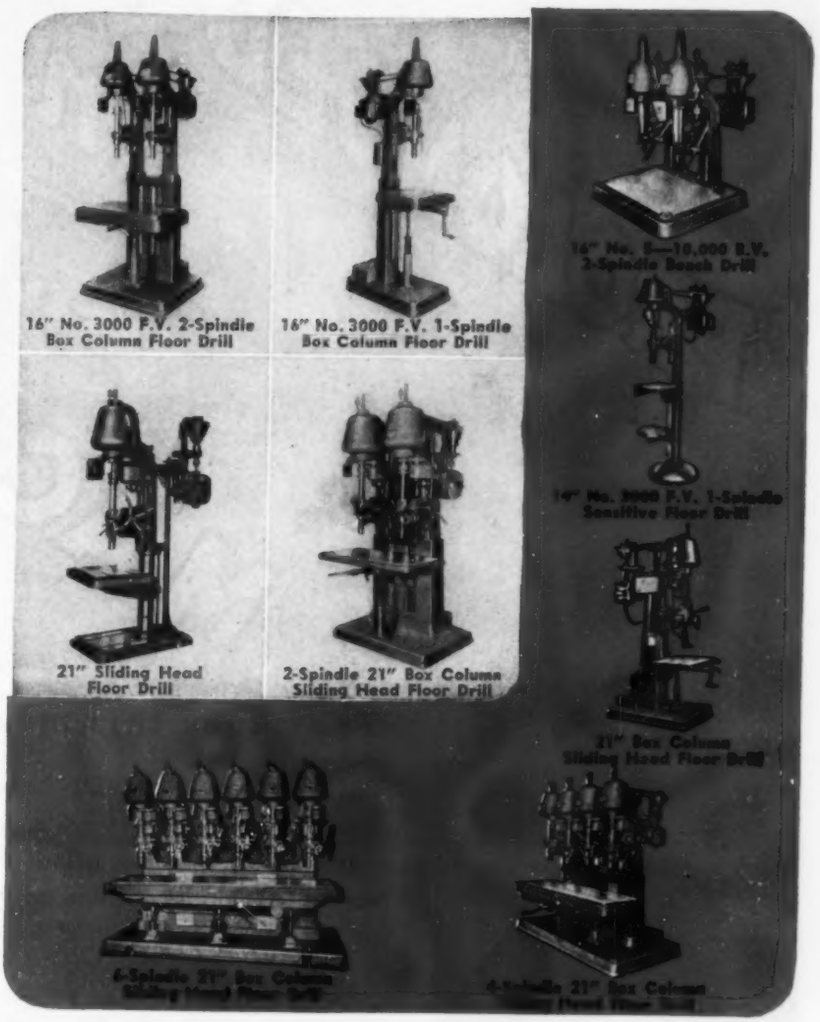
THE SYMBOL OF QUALITY · LINK-BELT · LB

LINK-BELT
Power Transmission Machinery

DRILL PRESSES by Canedy-OTTO

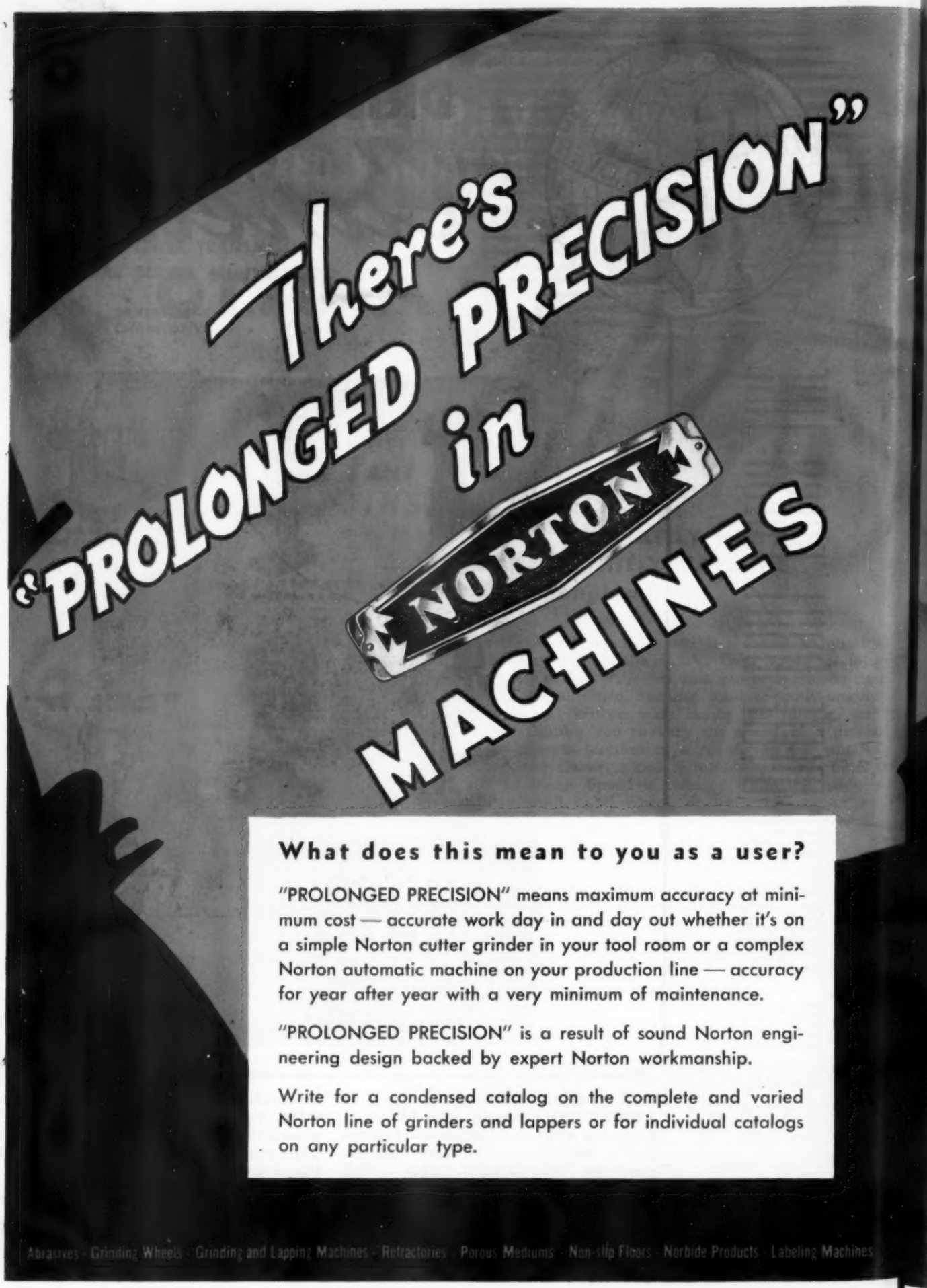
C THE WORLD OVER O

WORLD'S MOST COMPLETE DRILL PRESS LINE

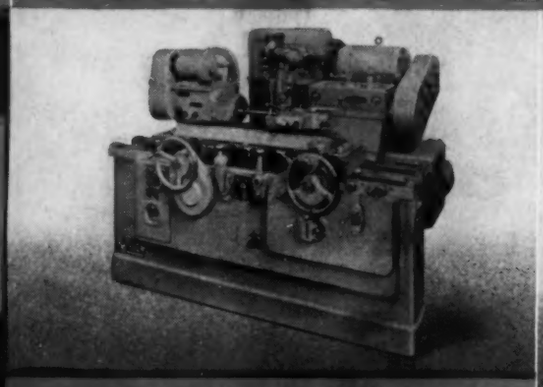

16" No. 3000 F.V. 2-Spindle Box Column Floor Drill
16" No. 3000 F.V. 1-Spindle Box Column Floor Drill
16" No. 5—10,000 R.V. 2-Spindle Bench Drill
14" No. 3000 F.V. 1-Spindle Sensitive Floor Drill
21" Sliding Head Floor Drill
2-Spindle 21" Box Column Sliding Head Floor Drill
21" Box Column Sliding Head Floor Drill
6-Spindle 21" Box Column
6-Spindle 21" Box Column

Drill presses, bearing the familiar CANEDY-OTTO name, are found in factories the world over — testifying to the world-wide, long-time acceptance of CANEDY-OTTO, "The World's Most Complete Drill Press Line." Before you specify or approve any drill press purchase, make a careful review of the CANEDY-OTTO line — a line providing an economical, standard unit for a very wide range of drilling requirements. Write us today for catalog, putting detailed information on the complete CANEDY-OTTO Drill Press line at your fingertips.

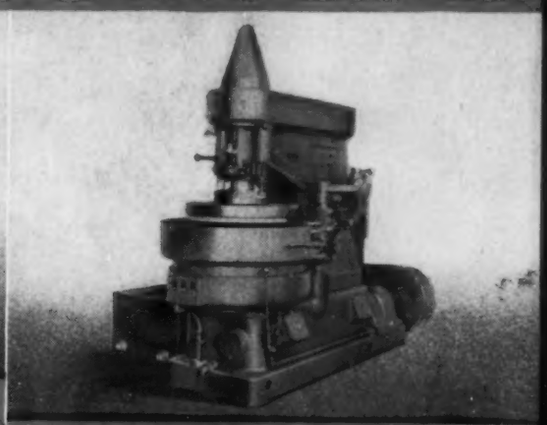
CANEDY-OTTO MFG. CO. CHICAGO HEIGHTS, ILL.


There's
"PROLONGED PRECISION"
in
NORTON
MACHINES
What does this mean to you as a user?
"PROLONGED PRECISION" means maximum accuracy at minimum cost — accurate work day in and day out whether it's on a simple Norton cutter grinder in your tool room or a complex Norton automatic machine on your production line — accuracy for year after year with a very minimum of maintenance.
"PROLONGED PRECISION" is a result of sound Norton engineering design backed by expert Norton workmanship.
Write for a condensed catalog on the complete and varied Norton line of grinders and lappers or for individual catalogs on any particular type.
Abrasives · Grinding Wheels · Grinding and Lapping Machines · Refractories · Porous Mediums · Non-slip Floors · Norbide Products · Labeling Machines

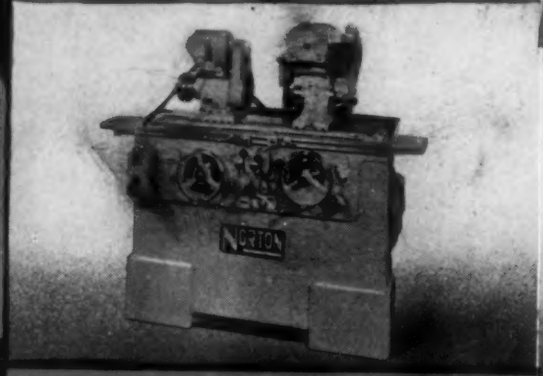
FOR GRINDING AND LAPPING



6 x 18" Type CTU Cylindrical Grinder

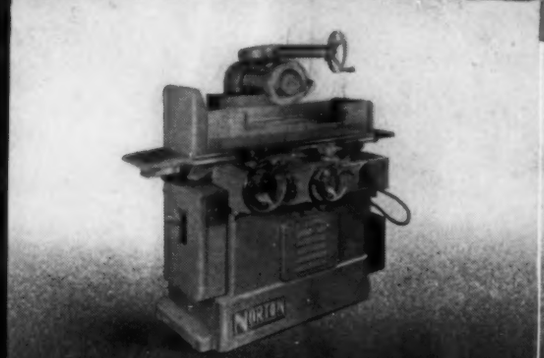


No. 16 HYPROLAP® Lapper

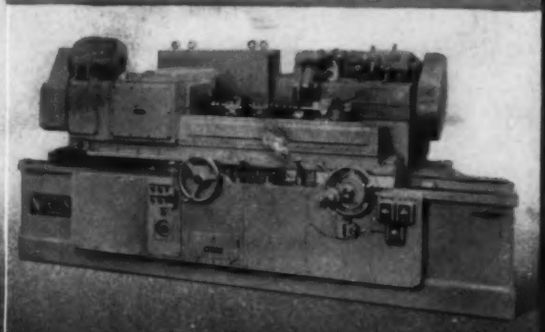


10 x 20" Universal Grinder

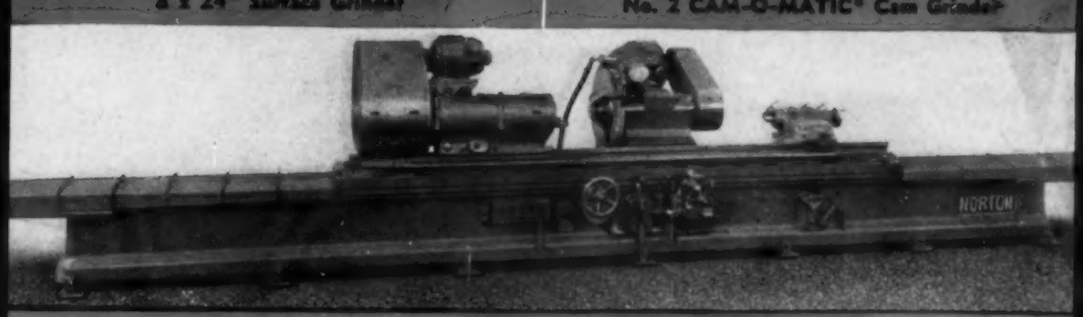
No. 20 Cutter and Tool Grinder



8 x 24" Surface Grinder



No. 2 CAM-O-MATIC® Cam Grinder



20 x 144" Type D Roll Grinder

Trade-mark reg. U. S. Pat. Off.

NORTON COMPANY, WORCESTER 6, MASS. • New York • Chicago • Detroit • Cleveland • Hartford • Distributors in All Principal Cities

THE AMERICAN TOOL WORKS C

THIS *SHOWS* IT BETTER THAN WE CAN *TELL* IT . . .

THIS IS one of those "high" jobs with the arm as high as it will go. But note that all control levers on the head are still within easy reach of the operator.

The value of the "American" Hole Wizard's concentrated control at the bottom of the head is clearly demonstrated by this job.

Note, also, how easy it is for the operator to make the speed changes for the different tools. Not only are the speed change levers within easy reach, but the speed change mechanism is direct reading so the operator can see how to get the speed he wants and get it quickly without fear of mistake.

Operators like "American" Hole Wizard Radials. Ask the man who runs one—see what he says. An operator gets more work from a machine he likes.

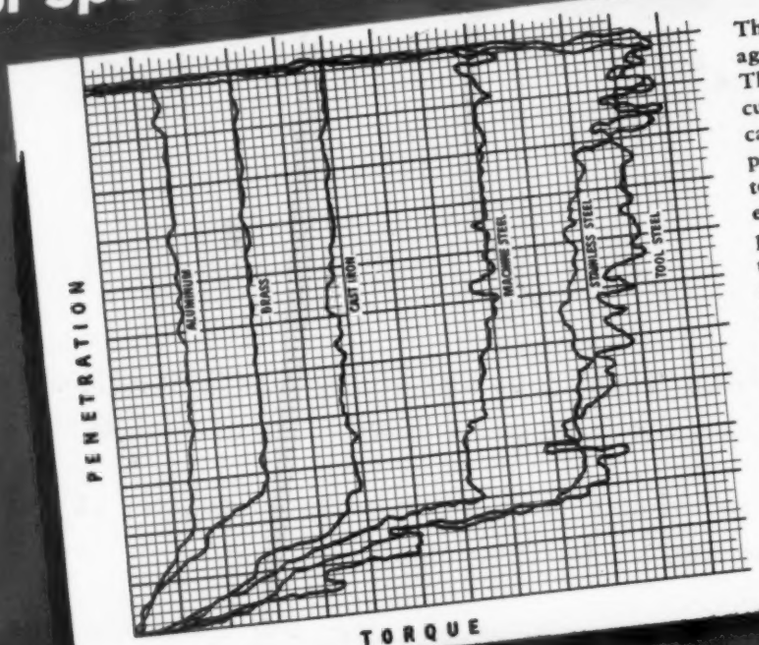
Descriptive Bulletin No. 327 tells the whole story. Want one?

C[illegible]*athes and Radial Drills* **Cincinnati, Ohio U.S.A.**

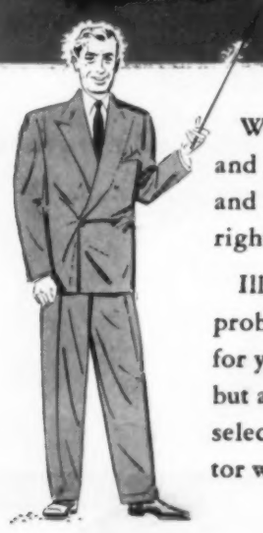
Take your Tip from these Torque Tests

(and many other MORSE Tests)

for Special Purpose Drills that Thrive on Work!

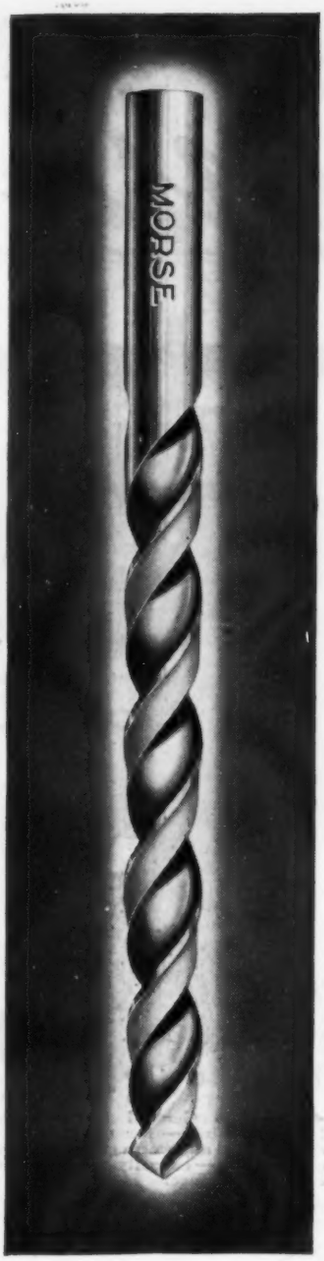


This chart shows drill penetration against torque in various metals. The curves are typical of a *series* of curves in similar tests. They indicate the performance of a special purpose drill as the design is altered for maximum cutting efficiency. Many "trial and error" tests preceded the one that produced the results shown and many other tests followed before the final design was approved. The high speed steel from which the drill is made, the helix angle, web thickness, heat treatment and angle of point are all variables that are studied and re-studied. This testing is typical of the continuous checking by the Morse Laboratory to develop drills that offer the best performance for special jobs.



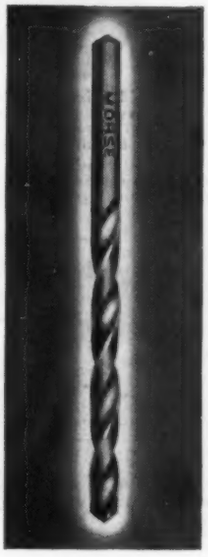
When *special* drilling problems prove troublesome, look to the Morse Laboratory and Morse engineering to meet the need in terms of *special purpose* drills. Morse skills and facilities *plus* long experience in the production of cutting tools that have proved right, is your assurance of the best working tool for *your* job.

Illustrated are five special purpose drills that have supplied the answers to challenging problems by cutting *faster* and lasting *longer*. Perhaps one or more of them is designed for you. But remember, *your* production may vary enough to require seemingly similar but actually quite different specifications. That is why we say let Morse lend a hand in selecting the drill that will do the superior job for *you*. Your Industrial Supply Distributor will be glad to help.



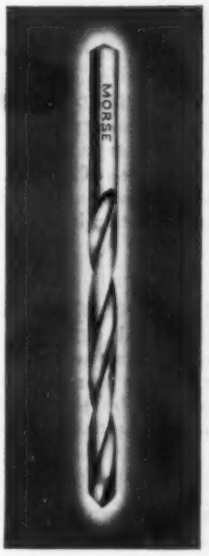
MORSE Quick-Twist Drills (1363) . . . for deep-hole drilling in aluminum, magnesium, die-cast metals; for slate, marble and certain plastics.

MORSE Cotter-Pin Drills (1386) . . . for skin metal, shallow-hole drilling, cotter-pin holes, steering arms, knuckles, gas burners and copper. Ideal in portable drills.



MORSE Cobalt Drills (2330) . . . for hard materials, can be run 25% faster. Used in rigid drill press with positive power drive capable of extreme point pressure.

MORSE Brass Drills (1344) Specially designed for work in brass. Made with wide grooves to clear chips easily. Special slow spiral.



MORSE Bakelite Drills (1361) . . . for Bakelite, Ebonite, asbestos, fibre, brass, hard rubber, various molded plastics. Withstands abrasion.

Accuracy, Quality, Uniformity: the MORSE Code of Cutting-Tool Manufacture

MORSE TWIST DRILL & MACHINE COMPANY

NEW BEDFORD, MASSACHUSETTS

A DIVISION OF VAN NORMAN COMPANY

York Store: 130 Lafayette St. • Detroit Store: 2952 East Grand Blvd. • Chicago Store: 570 West Randolph St. • San Francisco Store: 1180 Folsom St.

10 Points

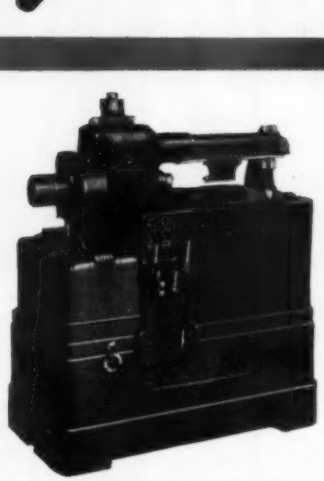
1 WIDE RANGE OF WORK: Spur gears, helical gears, worms, worm gears, sprockets and splines — in fact, most evenly spaced forms can be hobbed. A single hob will cut any number of spur or helical involute gear teeth on the proper diameter blanks for a given pitch.

2 MULTIPLE THREAD HOBS: Massive machine construction permits the use of large multiple thread hobs. This, of course, reduces cutting time as the number of threads in the hob is increased.

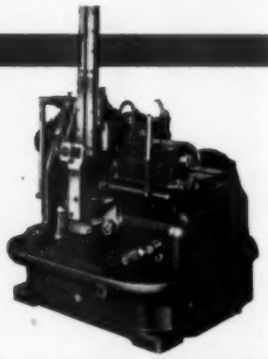
3 BATTERY OPERATION: Automatic cycling and capacity for large arbor loads permits a single operator to handle several machines as a battery, giving maximum production per man hour.

4 INCREASED FEED: Hobs and hobbing machines are designed to remove the maximum amount of metal per minute, consistent with finish requirements and optimum tool life.

5 LOW TOOL COSTS: Rigidity of work spindle, hob spindle and tail center support eliminates vibration and permits maximum hob life. Automatic Hob Shifter distributes wear evenly over all teeth, increasing hob life up to 50% on some jobs.

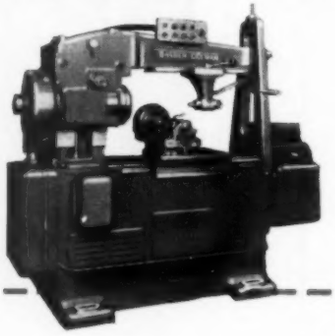


▲ No. 8-12 New Production Hobbing Machine — automatic cycle for high production of gears up to 8" dia. x 10" face. Also furnished with magazine loading.

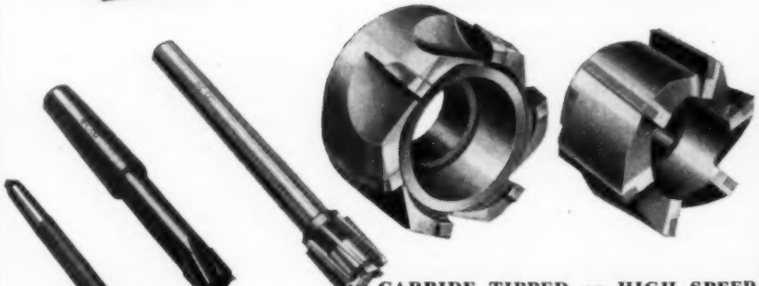


▲ No. 1-½ Automatic Hobbing Machine — for production of small precision gears up to 1" diameter x 1/2" face.

No. 14-15 Production Hobbing Machine — automatic cycle for high production of gears up to 14" diameter x 15" face. ▶



◀ No. 16-16 General Purpose Hobbing Machine — for production of spur, helical and worm gears, sprockets and splines — capacity up to 16" diameter x 16" face.



CARBIDE TIPPED or HIGH SPEED STEEL HOBS, CUTTER, REAMERS, and

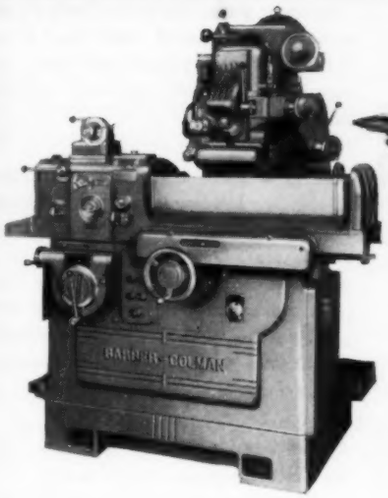
WRITE: — You are invited to submit specifications and requirements on production work in

Barber-Colman

MODERN MACHINES WITH ORDINARY CUTTING TOOLS ARE NOT FULLY EFFICIENT

TO COST REDUCTION

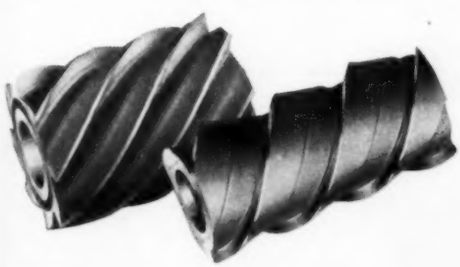
WITH BARBER-COLMAN COMPLETE HOBBING SERVICE

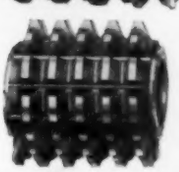


▲ No. 6-5 New Hydraulic Hob Sharpening Machine — automatic feed, wet or dry grinding, precision face sharpening of carbides and high speed steel tools up to 6″ diameter x 5″ face.

No. HRS Combination Sharpening ▲ Machine — sharpens hobs, cutters, reamers. 24″ stroke straight gashed work, or maximum 30° helix with 8″ stroke.

No. 8-10 Vertical Production Hobbing ▶ Machine — automatic cycle for high production of gears up to 8″ dia. x 10″ face.





SPECIAL TOOLS. Feature Job-Engineered Design and Specially developed Cutting Clearances.

your plant. Literature and cost estimates will be furnished without obligation. Ask for catalog 1148

6 **LOW MAINTENANCE:** Adjustments are built into moving machine elements for wear take-up. Unit construction plus rigidity of all moving and non-moving machine members means many years of dependable service and low maintenance.

7 **FLEXIBLE INVESTMENT:** Standard machine units operated in batteries for high-output on long production runs can readily be diverted to other work or shorter runs after changes in design or production requirements.

8 **ENGINEERING SERVICE:** Engineering service on all hobbing and milling problems is offered at no obligation. A staff of trained engineers, backed by years of field experience, stand ready to make practical recommendations on your difficult jobs.

9 **CONTROLLED TOOL MAINTENANCE:** Exact duplication in sharpening of the original mathematical relationship between design elements of hobs and formed cutters guarantees repetitive accuracy in work and conserves cutting life of tools.

10 **SPECIAL MACHINES AND TOOLS:** Barber-Colman Design Engineering Department often develop special machines or tools.

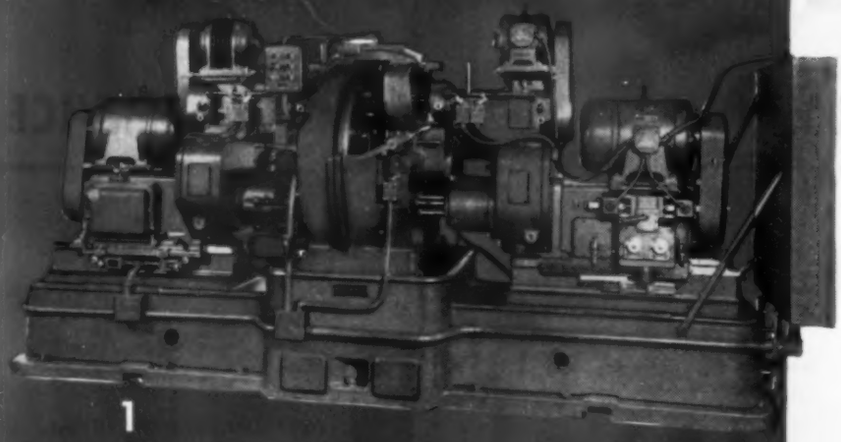
Company

GENERAL OFFICES & PLANT
111 LOOMIS STREET
ROCKFORD, ILLINOIS

BARBER COLMAN

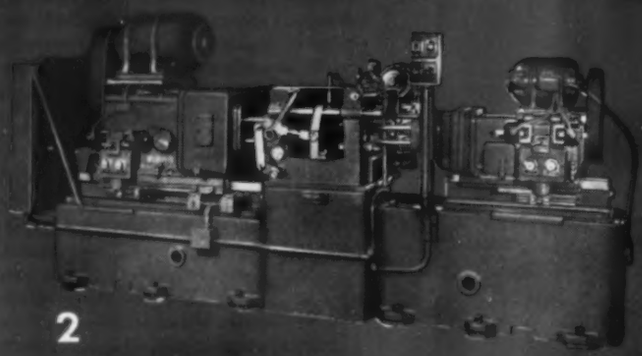
ACCURACY, RIGIDITY, POWER FOR HI-PRODUCTION HOBBING

The MORRIS
Radials and



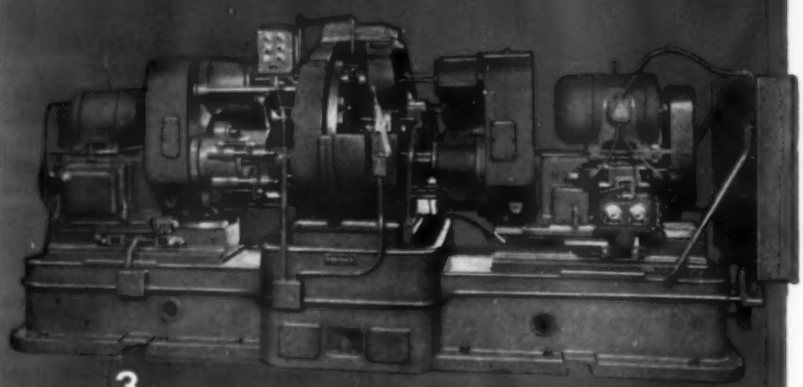
1

1. This two-way horizontal drilling and tapping machine for handling refrigerator compressor parts has a five station automatic indexing turret with hand clamp fixtures. Head approach and feed is accomplished by self-contained hydraulic units.



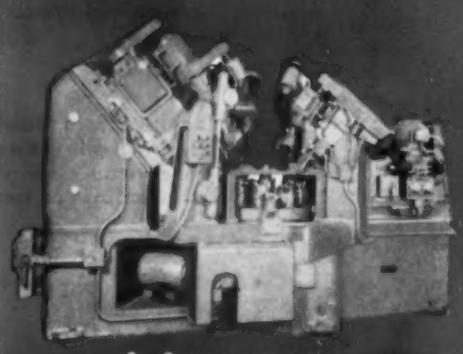
2

2. Here is a 3-way horizontal type with a 22-spindle left-hand unit, a 5-spindle right hand unit and a single spindle unit at the rear. All heads are powered by individual motors and all machine functions are automatic. The machine drills all holes in automobile valve chamber cover at one setting—a piece is completed at every cycle.



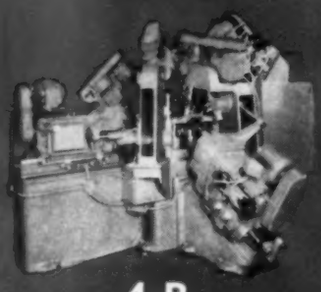
3

3. A two-way horizontal machine which handles drilling—reaming—countersinking—and tapping operations on seven pieces simultaneously. The machine has an eight station automatic indexing work head with hand clamping fixtures. All machine functions aside from loading and clamping are automatic.



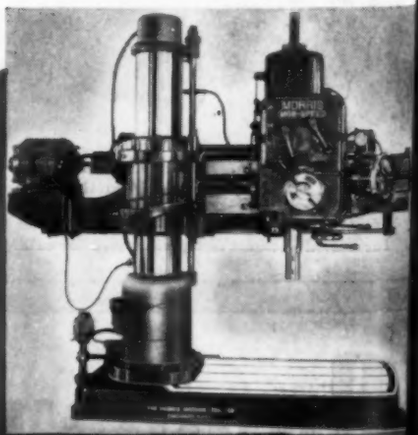
4-A

4-A This machine was designed to drill, chamfer and tap refrigerator bearing plates at various angles. It has an eight station automatic indexing table for carrying the work and independent hydraulic units carry the 9 drill spindles and 1 tap spindle.



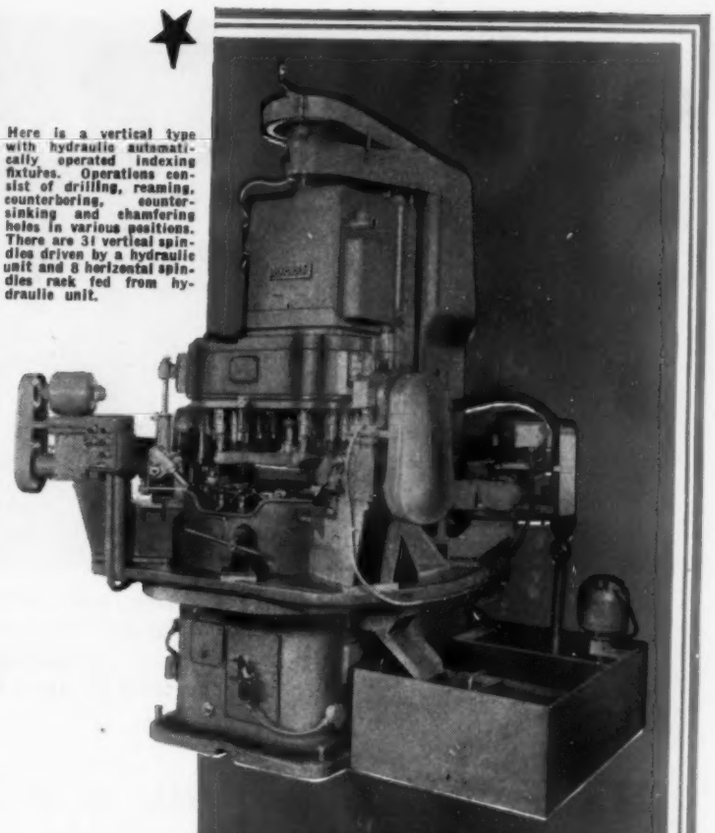
4-B

4-B Rear view of above machine.



MORRIS MOR-SPEED RADIAL

MOR-SPEED LINE
High Production Machines



Here is a vertical type with hydraulic automatically operated indexing fixtures. Operations consist of drilling, reaming, counterboring, countersinking and chamfering holes in various positions. There are 31 vertical spindles driven by a hydraulic unit and 8 horizontal spindles rack fed from hydraulic unit.

● The name MORRIS has for years symbolized a high quality—versatile line of Radial Drills which are available in 3′, 4′, 5′ and 6′ arm lengths on 11″ columns.

More recently Morris has augmented this line of radial drills with a line of Mor-Speed High Production Machines. They are furnished in vertical and horizontal models to meet the specific production need of the customer. These machines handle a wide range of drilling—reaming—boring—facing and tapping operations on a mass production basis. A few of the many types furnished are illustrated.

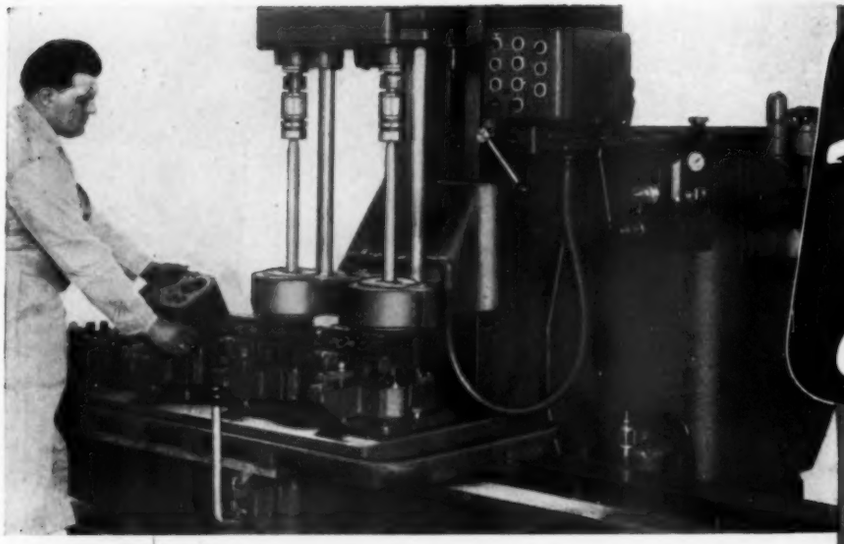
Morris has the engineering "know-how"—the experience—and manufacturing facilities to design and build high production machines to meet your requirements plus a line of radial drills for standard production needs. *Write for full descriptive bulletins.*

Illustrated are two vertical type machines which operate as a team for reaming holes in automotive cylinder blocks. The machine at the left is used for line reaming valve port, valve guide bushing hole and valve poppet hole. The head starts at high speed feed for small diameter reaming and automatically changes to slow speed for reaming valve port. The machine at the right reams valve guides after they have been pressed into the block.

Builders of MOR-SPEED Line

The MORRIS Machine Tool Co.

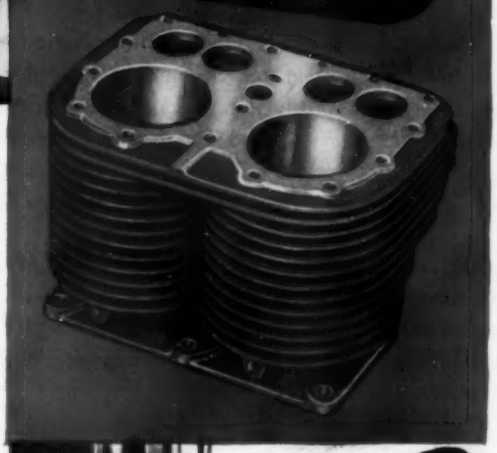
CINCINNATI 3, OHIO



No. 307 Honing Machine, with 2-spindle Auxiliary Head and hydraulic Lateral Index Table, for stock removing and finishing 2-cylinder motor blocks.

BORE: 3-1/4" DIA. x 6-1/2" LONG **MATERIAL: CAST-IRON**
STOCK REMOVED: .005" **PRODUCTION: 60 BLOCKS PER HOUR**

Time Control is Cost Control

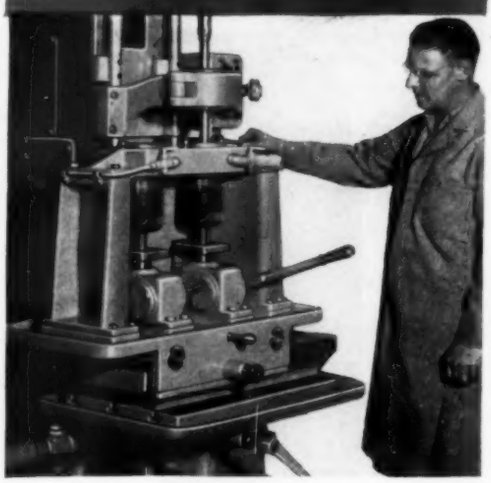


BARNESDRIL HONING MACHINES COMBINE STOCK REMOVAL WITH CONTROLLED SURFACE FINISHING . . . . . .

Putting uniform surface control and dimensional accuracy within ten-thousandths of an inch on a production basis is one way to cut manufacturing costs. Either of these operations is time-consuming and requires highly skilled techniques. When both are combined in one automatic operation, greater productivity and savings in time and cost result.

BARNESDRIL Honing Machines provide this high speed production method for controlling accurate stock removal and uniform surface finish in the *same operation.* Applied to either internal or external diameters, metal parts requiring accurate, smooth surfaces and tolerances for straightness and roundness, can be mass-produced with assured quality control and a minimum of time and expense. With automatic cycling and hydraulic hone expansion, production rates are obtained up to the capacity of the operator.

Check these possibilities against your present operations and costs. If control over surface finish and accurate stock removal is needed in your production, substantial economies will result by honing. Ask a BARNESDRIL Field Engineer to call and discuss the advantages of honing on your work. You will also want to see a copy of our complete Honing Machine Catalog.



No. 224 Honing Machine, single spindle with manual Index Table, for stock removal and finishing engine cylinders.

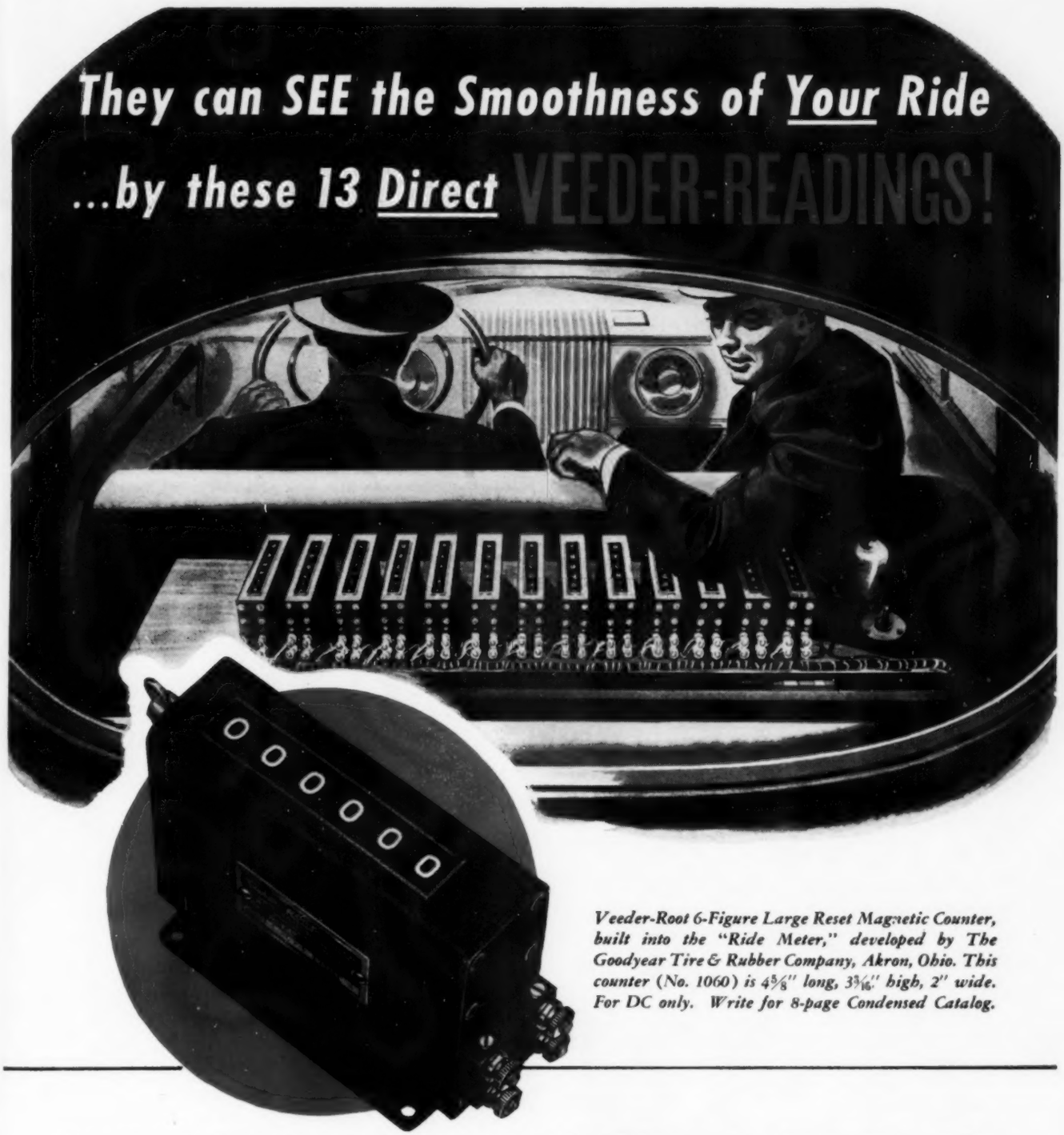
Bore: 2" dia. x 3.9" long **Material: Cast-iron**
Stock Removed: .005" **Production: 40 pieces per hour.**

Write for **BULLETIN B-1214**

BARNES DRILL CO.

830 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

They can SEE the Smoothness of Your Ride ...by these 13 Direct VEEDER-READINGS!



Veeder-Root 6-Figure Large Reset Magnetic Counter, built into the "Ride Meter," developed by The Goodyear Tire & Rubber Company, Akron, Ohio. This counter (No. 1060) is 4⅝" long, 3 3/16" high, 2" wide. For DC only. Write for 8-page Condensed Catalog.

If you sat on the floor of your car, without any cushions to blot up the bumps... could you count the number of road-shocks?

No one could count them! And that's exactly why Goodyear developed the ingenious "Ride Meter" which—attached to the right front axle—indicates the riding qualities of Goodyear tires.

This "Ride Meter" is a series of electrical switches, placed so that they are actuated progressively for each excursion (or movement) of the axle, either toward or away from the frame of the car. Each switch is relayed to actuate the corresponding Veeder-Root Counter in the bank of 13 counters mounted in the rear seat. This counter-record shows number and distribution of axle-movements—guides Goodyear engineers toward greater tire-resiliency and greater riding comfort.

This is one of the ways (ways too numerous to count) in which Veeder-Root Devices—by *direct* readings—give instant information on any situation that involves motion, mass or flow. Veeder-Root Counters can be built into products as original equipment, or easily attached to products in service. And you can count on "The Counting House" to show *you* how. Write.

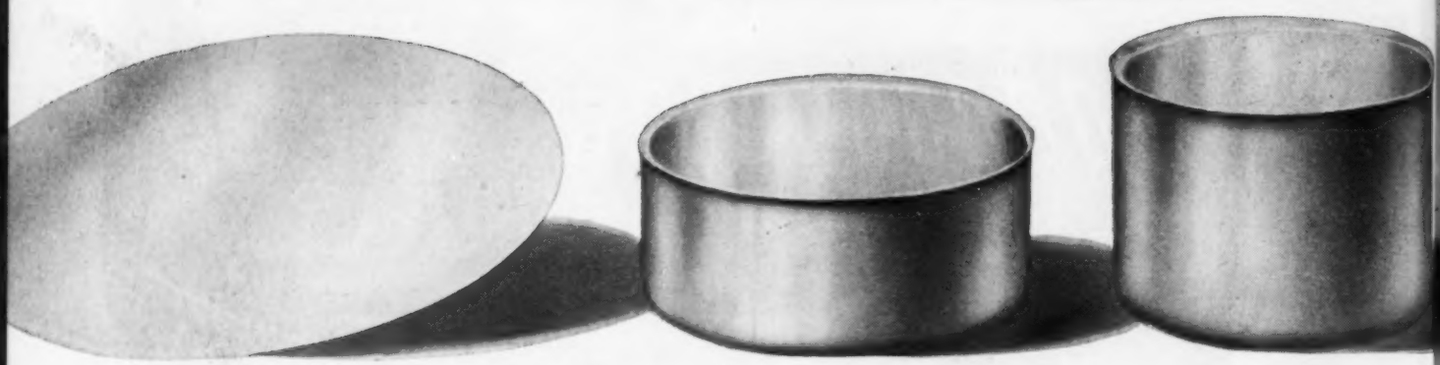
VEEDER-ROOT INC.

HARTFORD 2, CONN.

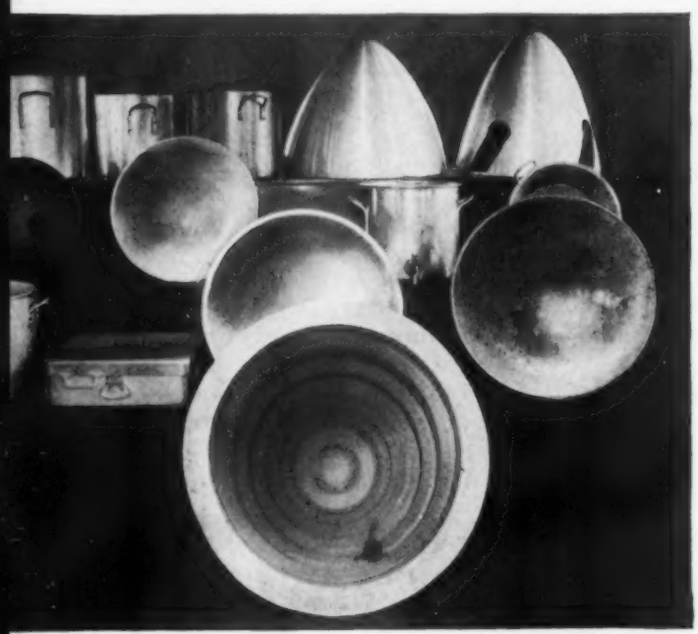
In Canada: Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3.
In England: Veeder-Root Ltd., Dickinson Works, 20 Purley Way, Croydon, Surrey.

DEEP-DRAWING STAINLESS STEEL

With Controlled Speed and Pressure at Full Length of Stroke



YOU JUST DON'T DRAW the wide variety of seamless stainless steel and aluminum products shown below *on any press.* They demand presses with inherent flexibility for setting dies, for changing strokes and varying speeds and for maintaining uniform, controlled draw and pressure at full length of stroke.



That's why Bliss double-action presses are the choice of a leading manufacturer in deep-drawing seamless stainless steel kitchen and hotel ware.

Bliss hydraulic presses save set-up time, guard against die breakage—and increase production of uniformly high quality products. Controlled drawing speed, slide within slide construction, separate power-saving blank-holder pump, push-button instant controls plus the exclusive HYDRO-DYNAMIC System, keep Bliss presses busy on short and long runs. Double-action presses are easily converted into single-action units.

These are important factors to consider for *your* future deep-draw work in stainless steel, aluminum, brass and other metals. And good reasons to write today for our 64-page book "HYDRO-DYNAMIC PRESSES" which contains many production examples and advice on *selecting the right press for the job.*

Remember this, too: whatever your press application—mechanical or hydraulic—Bliss can help you.

E. W. BLISS COMPANY, DETROIT 2, MICH.

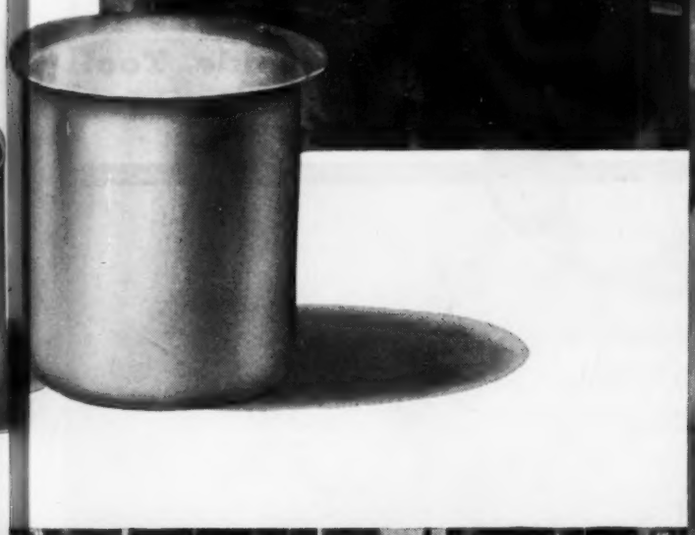
Mechanical and Hydraulic Presses, Rolling Mills, Can and Container Machinery

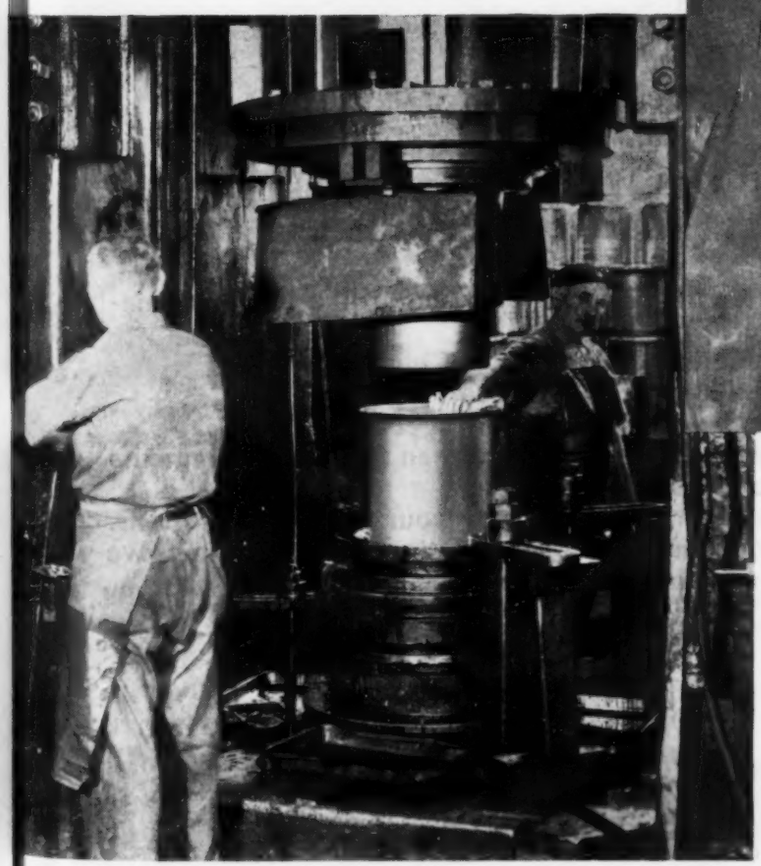
WORKS AT: Toledo, Cleveland, Salem, Ohio; Hastings, Michigan; Englewood, N. J.; Derby, England; St. Ouen sur Seine, France • SALES OFFICES: Detroit; New York; Cleveland, Dayton, Toledo, Ohio; Hastings, Michigan; Chicago; Philadelphia, Pittsburgh, Pennsylvania; Rochester; New Haven; Boston; Windsor, Ontario

BLISS BUILDS MORE TYPES AND SIZES OF

Progressive stages in the deep-drawing of a ten-gallon stainless steel stockpot, starting with a circular blank .102" thick.

First two draws are illustrated at left and below. Bliss Hydro-Dynamic Presses, used on both stages provide controlled speed and pressure at full length of stroke.





The final draw takes place on a large Bliss mechanical double-action press. Twelve hundred of these stockpots per day are produced on Bliss presses.

STAY AHEAD WITH *Bliss*

PRESSES THAN ANY OTHER COMPANY

if

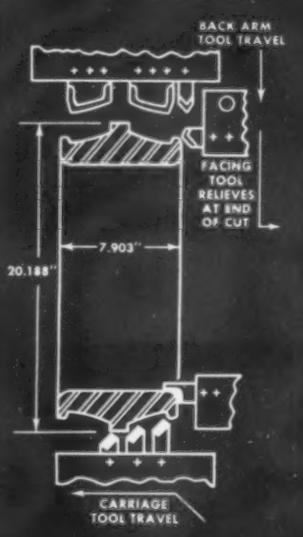
YOU CAN CUT YOUR TURNING COSTS

your lathes have the Power, Rigidity and Spindle Speeds to use Carbide Tools effectively.

for instance . . .

Here's a revolutionary example of power turning on a husky Roller Bearing Inner Race. The machine is the New Jones & Lamson 28" Fay Automatic Lathe.

A total of 98 POUNDS OF SAE 52100 STEEL is removed from the forging in only 8 MINUTES. Note the power requirements for the two 2-7/8" forming cuts at 330 SFM and .00375 Feed. The load created by the two carbide tipped form tools is IN EXCESS OF 100 HORSEPOWER!



Manufacturer of: Universal Turret Lathes · Fay Automatic Lathes · Automatic Double-End Milling and Centering Machines · Automatic Thread Grinders · Optical Comparators · Automatic Opening Threading Dies and Chasers · Ground Thread Flat Rolling Dies

YOU CANNOT COMPETE with production like this with machines less powerful, less rigid.
Jones & Lamson Lathes guarantee your investment.
***They anticipate* the future in metal turning.**
***They are built* with great reserves of ruggedness.**
***They are powered* to meet even more than today's requirements for the effective use of carbide tools.**
Let a Jones & Lamson engineer study your turning operations. He will be able to make recommendations that will improve your profit picture. He has for others.

JONES & LAMSON MACHINE COMPANY, Springfield, Vermont, U. S. A.

Jones & Lamson Lathes

ARE POWERED FOR CARBIDE

FIG. 732
Drawer is extra
Patd. & Pats. Pend.

FIG. 1855
"HALLOWELL" TOOL STAND of steel may be had with rubber-tired casters.

HALLOWELL

SHOP EQUIPMENT OF STEEL

"Hallowell" Ready-Made Shop Equipment is designed and built for ***utility, long service, hard wear*** and ***comfort.*** The line comprises: Work-Benches, Tool Stands, Foreman's Desks, Chairs, Stools, and Trucks,—in a wide variety of styles and sizes—all built of sturdy, hard-wearing steel welded for strength.

The "Hallowell" Ready-Made, Fire-Resistant Work-Bench of Steel with flared feet . . . stands firm without costly bolting to the floor . . . is made in a number of standard heights, widths, and lengths. Lack of space prohibits a full description of "Hallowell" Tool Stands, Foreman's Desks, Stools—all of steel. Be sure to write for your copy of the "Hallowell" Catalog . . . it's complete and absolutely necessary when you're ordering "Hallowell" Shop Equipment.

"Hallowell"
Products are sold entirely through Industrial Distributors.

OVER 45 YEARS IN BUSINESS

FIG. 2197
"HALLOWELL"
FOREMAN'S DESK OF STEEL

FIG. 200 S

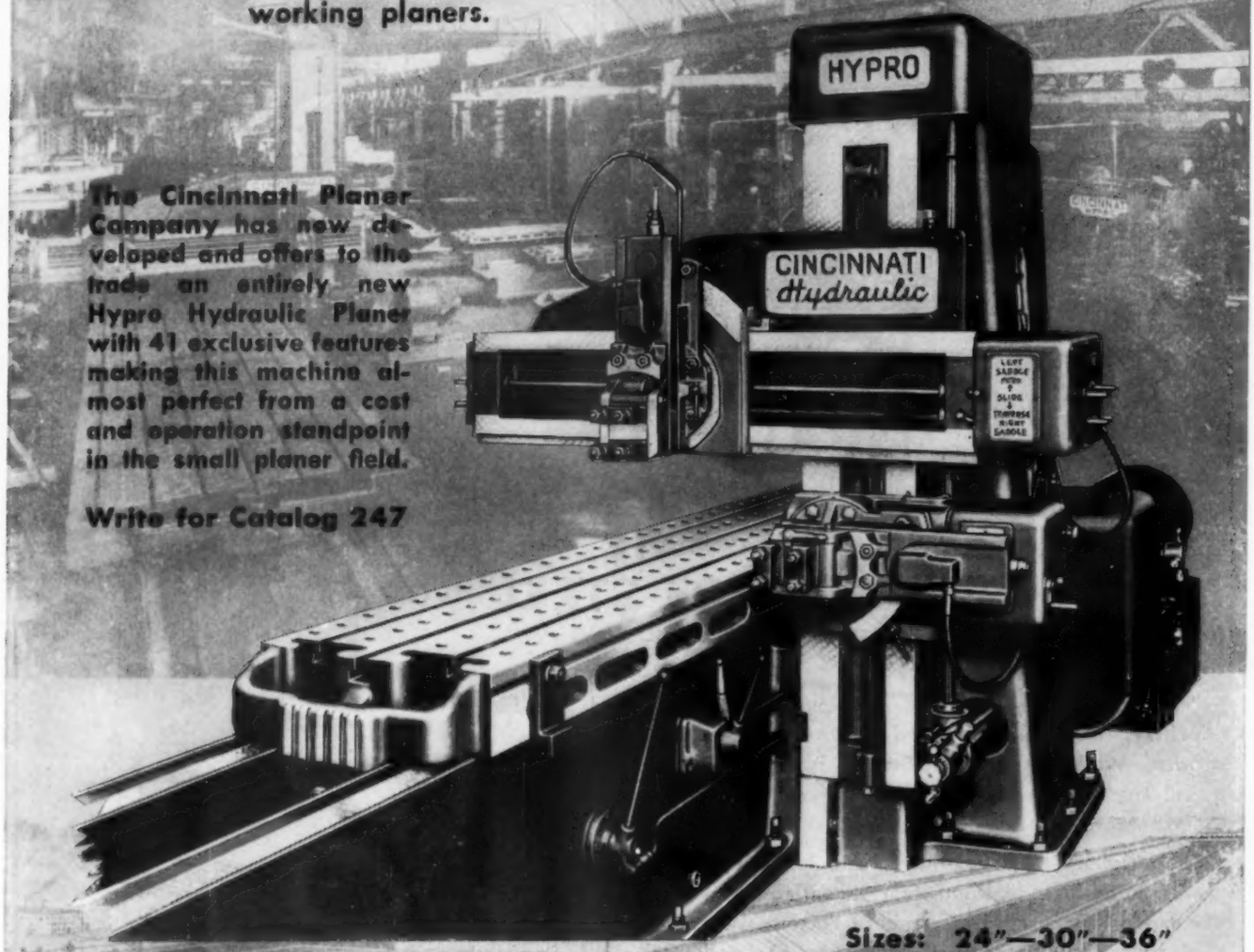
FIG. 210 RHB

"HALLOWELL"
STOOLS OF STEEL

STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNA., BOX 4 • BRANCHES BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST LOUIS • SAN FRANCISCO

A New Hypro Planer

Look at its Background... 50 years of continuous proven leadership in the design and manufacture of metal working planers.



The Cincinnati Planer Company has now developed and offers to the trade an entirely new Hypro Hydraulic Planer with 41 exclusive features making this machine almost perfect from a cost and operation standpoint in the small planer field.

Write for Catalog 247

Sizes: 24"—30"—36"
Double Housing or Openside

THE CINCINNATI HYPRO PLANER COMPANY
PLANERS - BORING MILLS - PLANER TYPE MILLERS
CINCINNATI, OHIO

TWIST DRILL

MILLING CUTTERS

HOBS

REAMERS

UNION

SAWS

GROUND FORM TOOLS

TAPS

END MILLS

DIES

GEAR CUTTERS

THE TOOLS YOU BUY AGAIN!

Union can supply the correct tool for almost every job of metal removal—drills that cut cleanly and evenly, cutters that BITE . . . and keep biting. Union tools enable you to take full advantage of the production potential of your machines. Try them on your toughest jobs, and we are sure they'll become—"the tools you buy again!"

UNION TWIST DRILL CO., ATHOL, MASS.

UNION . . . . BUTTERFIELD . . . . S. W. CARD
DIVISIONS OF THE UNION TWIST DRILL CO.

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BUTTERFIELD

"Thred-Rite" DIES

Graduated micrometer lock nut adjustment can be set to split thousandths! Full floating design assures accurately centered work! Rugged construction holds accuracy under high speed, heavy duty operation! Use the simple, accurate, efficient "Thred-Rite" Die on jobs where accuracy must be maintained with minimum attention. They are built in a full range of standard sizes, with NC or NF threads, in carbon or high speed steel. Get full details from your nearest Butterfield store.

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More and more tap users are specifying CARD for every tapping job. They know that it pays to go to a specialist. They know that they can get the right answer to every tapping problem from this single, convenient, complete source of supply. They know that—in the test of service—Card Taps have given them long runs of threads, high output on all types of materials and under all conditions, and precision results that satisfy their most exacting demands.

S. W. CARD MFG. CO.

MANSFIELD, MASS.

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CUT SET-UP TIME UP TO 50%

Kearney & Trecker Announces One of the Most Important Developments Ever Made in Milling Machine Design—the Built-In Chuck-Type Table

HOW would you like to have a quick-loading, work-holding fixture tailor-made for every job? This new Kearney & Trecker development amounts to just that! It's specifically designed to simplify milling job set-ups and to reduce excess material handling and set-up time.

Yes! This new *built-in* Chuck-Type Table quickly handles simple run-of-the-shop jobs . . . and just as readily adapts itself to handle unusual or hard-to-hold workpieces. In actual tests, workpieces, both large and small, simple and complex, have been set-up and machined in fractions of the time formerly required.

Equally important, the extra-close limits to which these tables are machined give you greater set-up accuracy and greater set-up rigidity — that means better results on every job!

The *built-in* Chuck-Type Table is available now in three standard working ranges on the following Kearney & Trecker standard knee-type milling machines, plain or vertical styles: (1) 34″ power table feed — Models 2K, 3H and 20 CSM. (2) 42″ power table feed — Models 3K, 4H and 30 CSM. (3) 50″ power table feed—Models 4K, 5H and 50 CSM.

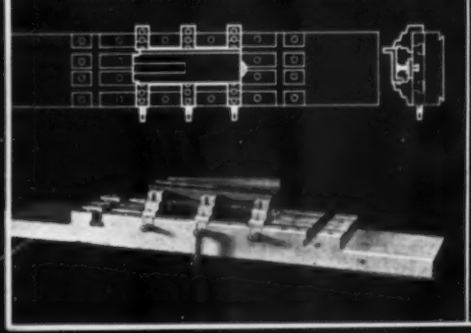
Accessories include screw and spring jacks, bumper stops and a variety of interchangeable, reversible vise jaws with hard, soft, plain, serrated, flat or radius faces depending on the surface or material to be clamped. The high speed and flexibility with which these accessories can be adapted to various jobs will amaze you.

If you are planning on new milling machine equipment in your shop—it will pay you to get complete details on the new Kearney & Trecker *built-in* Chuck-Type Table. Contact your nearest Kearney & Trecker Office or Dealer, or write direct to Kearney & Trecker Corporation, 6784 W. National Avenue, Milwaukee 14, Wis.

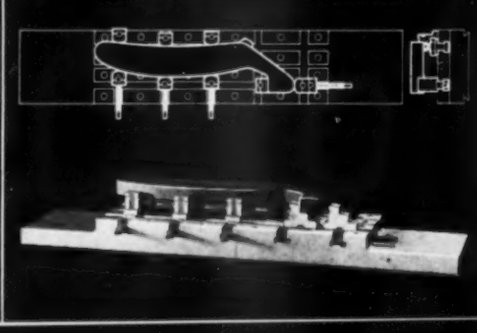
KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS

SEE THESE EXAMPLES OF HOW TYPICAL SET-UPS ON NEW CH

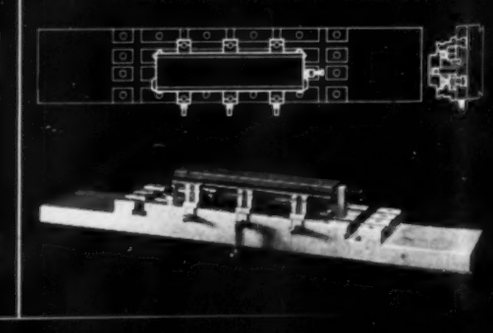
AVERAGE SET-UP TIME: 15 MINUTES



AVERAGE SET-UP TIME: 25 MINUTES

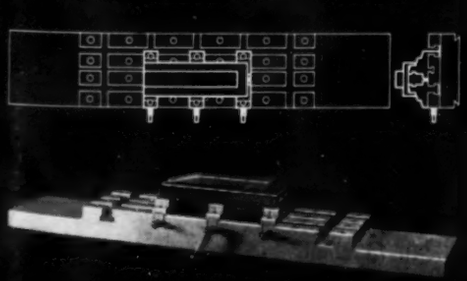


AVERAGE SET-UP TIME: 15 MINUTES

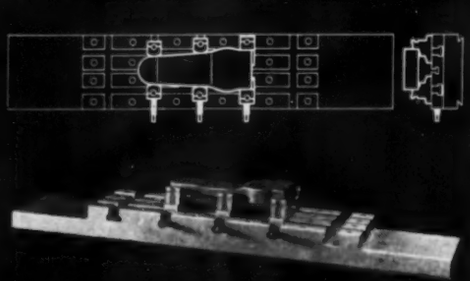


NEW CHUCK-TYPE TABLE SAVE TIME... GIVE GREATER RIGIDITY

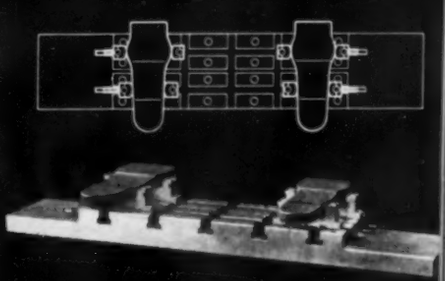
AVERAGE SET-UP TIME: 12 MINUTES



AVERAGE SET-UP TIME: 15 MINUTES



AVERAGE SET-UP TIME: 20 MINUTES



Van Keuren HEADQUARTERS

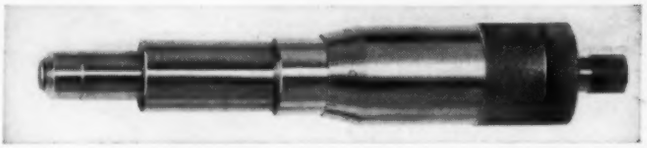
New

NEW 0 TO 3" LIGHT WAVE MICROMETER

The New 0 to 3" Light Wave Micrometer, enables anyone to measure in units of .00001". It is fast, accurate and profitable. It features:—

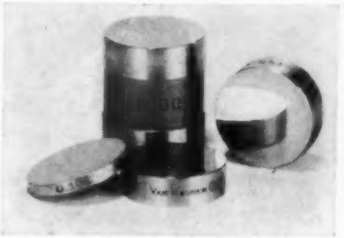
- Long life ½" diameter 40 thread micrometer screw.
- Detachable and positive aligning spindle contact.
- Vernier index reading to .00001".
- Index lock.
- Carboloy tipped spindle and anvil.
- Sturdy adjustable subanvil for perfect alignment.
- Enclosed light wave indicator.

NEW LIGHT WAVE MICROMETER HEAD



The New Van Keuren light wave micrometer head is a sturdy, long life, ultra precision micrometer head suitable for application on modern machine tools, precision instruments, research problems and inspection devices. A calibration chart, showing the errors in units of .00001" is furnished with each head. All heads are within .00005" absolute error at any point between 0 and 1".

THE NEW VAN KEUREN 7/8" DIAMETER MICROGAGES, are the best buy...



60% more wearing surface . . . 25% greater accuracy . . . Body true cylinders . . . Ends square with body . . . No increase in price.

Van Keuren Microgages have been popular for over 25 years as a low cost means of securing in the shop, the accuracy required by the inspection department. They are now made 7/8" instead of 11/16" body diameter at no increase in price. This results in 60% longer life—25% greater accuracy and provides needed rigidity in long gages.

A New Set M 21, containing 1", 2", 3", 4", 5" and 6" Microgages, is particularly useful for setting large micrometers. Price $60.00. For prices on other sets and individual gages see the 1948 Catalog No. 34.

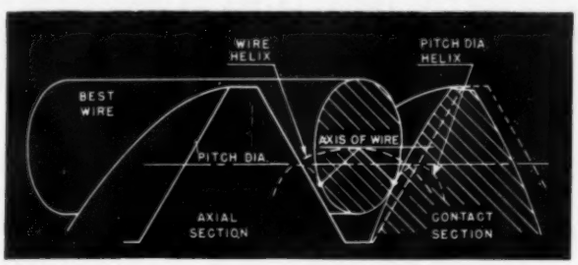
THE Van Keuren COMPANY,

29th YEAR

FOR PRECISE MEASUREMENTS

Developments for 1948

NEW THREAD MEASURING FORMULAS



Now for the first time, as a result of two years research sponsored by the Van Keuren Co., new formulas and tables are available for the exact pitch diameter measurement of screws and worms of known or unknown profile.

THE FUNDAMENTAL FACT. The axis of a wire resting in a thread groove, assumes a position tangent to the helix passed thru the CENTER OF THE WIRE, and not the helix thru the point of contact.

The New 1948 Van Keuren Catalog and Handbook No. 34 includes the new formulas and 10 New tables which reduce the computations for Best Wire Sizes and The Exact Measurement over wires to operations of simple multiplication and division.

TWO NEW WIRE TYPE PLUG GAGE HANDLES

Designed for UTILITY, LIGHTNESS, HOLDING POWER, and LONG LIFE

NEW

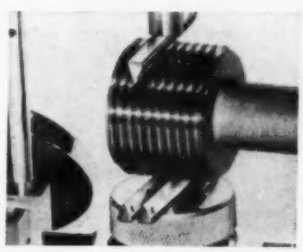
Giant's Grip,—wedge lock handle.
Range .500" to 1".

Safety Bushing Handle.
Range .020" to .500"

NEW

Wafer Finger tip Handle.
Range .001" to .020"
Weight 1/30 Oz.

NEW ROOT DIAMETER MEASURING WIRES



The New Root Diameter Measuring Wires will enable measurements to be made of the root diameter of threads, more accurately than can be made by expensive optical projectors. Root diameter measuring wires are triangular shaped high speed steel wires 1¼" over all length, .150" from base to apex and with a hole in one end for suspension. Only one set of three wires is needed for measuring National Form 60° threads, Whitworth 55° threads or Lowenhertz 53°-8" threads of any pitch from 4½ to 64 threads per inch.

Price per set of 3 wires.....$25.00

NEW 1948 CATALOG & HANDBOOK NO. 34

The New 1948 Catalog and Handbook No. 34, is a 208 page volume, which has been in preparation for nearly 2 years. It contains New and Epoch Making formulas and tables for the exact measurement of screws and worms.

Partial list of contents:

- Gear Measuring Tables with 1.728" and 1.44" Wires.
- The Buckingham Gear Measuring Formulas.
- Measuring Internal Gears.
- Measuring Helical Gears.
- Enlarged Gears and Reduced Pinions.
- New 30° Involute Splines.
- New Involute Serrations.
- Measuring Taper Threads.
- Screw Thread Systems.
- New Thread Measuring Formulas.
- New Method of checking ring seals with optical flats.
- Measuring Angles.
- Change Factors for measuring wires.
- Notes on gaging holes.
- Mathematical functions.
- Publications of interest to engineers.
- New Methods of measuring angle of screw threads.

Please send me, without charge, my complimentary copy of the New 1948 Van Keuren Catalog and Handbook No. 34.

Name ..... *Position* .....
Firm .....
Business Address .....
Home Address .....
Enclosed herewith is ☐ *Check* ☐ *Money Order for $*..... *to pay for*

☐ Additional copies at $1.00 each

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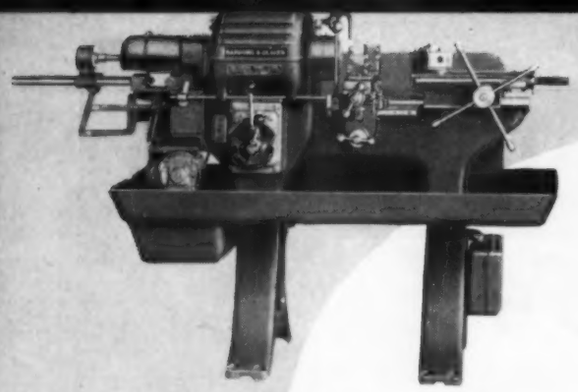
ght Wave Equipment • Light Wave Micrometers • Gage Blocks • ger Insert Plug Gages • Wire Type Plug Gages • Measuring Wires Thread Measuring Wires • Gear Measuring System • Shop angles • Carboloy Plug Gages • Carboloy Measuring Wires

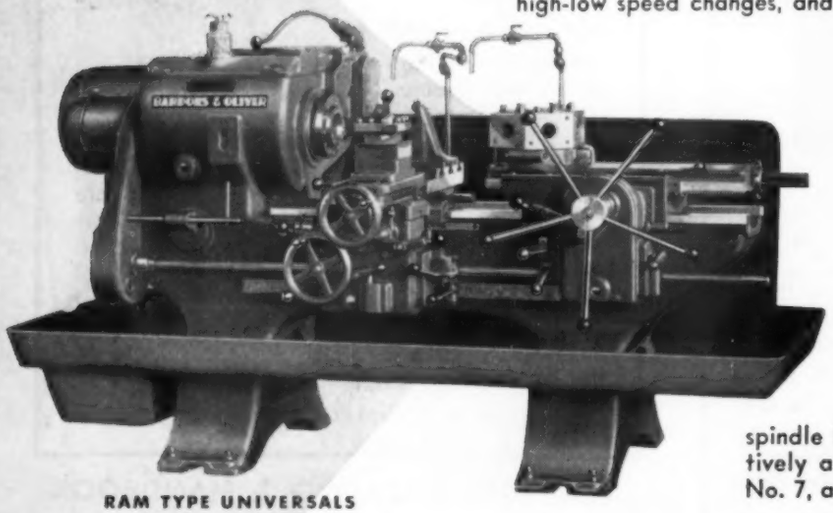
BARDONS &

A Complete Line of TURRET LATHES



GEARED ELECTRICS
(No. 1 pictured)
No. 1:—Bar Capacity ⅝" x 5"
No. 2:—Bar Capacities, average duty work 1" x 7", light duty work 1¼" x 7", swing 13½"

THE NO. 1 AND NO. 2 GEARED ELECTRIC TURRET LATHES are unexcelled for the rapidity and high frequency of spindle reversals. Six of the twelve speed changes are controlled by a single lever. Electric Remote Control may be used to automatically control, by the motions of the turret slide, the spindle reversals, the high-low speed changes, and the opening-closing of the collet chuck.



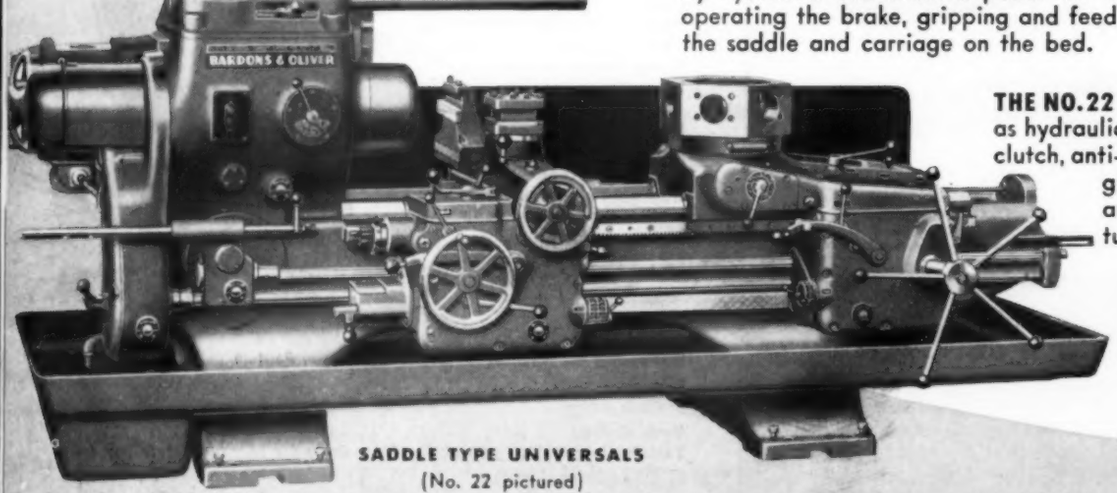
THE NO. 3 IS THE SMALLEST, FASTEST, AND EASIEST OPERATED UNIVERSAL TURRET LATHE BUILT. Many outstanding features have made it very popular, especially among women operators. It is a highly productive machine for smaller bar and chucking work.

THE NO. 5 UNIVERSAL TURRET LATHE is outstanding for high production and easy operation on medium sizes bar and chucking work. The head is very powerful. The double wall bed with angular cross ribbing forms a most rigid base for the two tool carrying units. The hydraulic preselective speed change and spindle brake contribute to the easy control. It is distinctively a different size throughout than the No. 3 or the No. 7, and is thus the ideal size for medium range of work.

RAM TYPE UNIVERSALS
(No. 7 pictured)
No. 3:—Bar Capacities, average duty work 1½" x 9", light duty work 2" x 9", swing 15⅜"
No. 5:—Bar Capacities, heavy duty work 2" x 12" average duty work 2½" x 12", swing 18"
No. 7:—Bar Capacities, heavy duty work 2½" x 14", average duty work 3" x 14", swing 21½"

THE NO. 7 IS THE LARGEST, MOST POWERFUL, AND MOST RIGID RAM TYPE UNIVERSAL TURRET LATHE BUILT. An unusual amount of smooth flowing power can be transmitted through the head. The wide, double wall bed with X-ribbing furnishes an exceptionally rigid support for the tool carrying units. Hydraulic force does the work of changing the spindle speeds, of applying the power brake, and of gripping and feeding the bar stock. For taking the heaviest cuts, and for removing the maximum metal in the minimum time, this ram type turret lathe is unrivaled.

THE NO. 21 AND NO. 22 SADDLE TYPE TURRET LATHES are powerful, heavy, and rigid, yet excel in ease of control. Physical effort is replaced by hydraulic and electric power for changing the spindle speeds, operating the brake, gripping and feeding the stock, and traversing the saddle and carriage on the bed.



THE NO. 22 has such additional features as hydraulic operation of the main drive clutch, anti-clash hydraulic speed change governor, hydraulic indexing and clamping of the hexagon turret, and hydraulic shifting of the feed change gears as previously selected. The cross slide, as well as the carriage and saddle, has power rapid traverse.

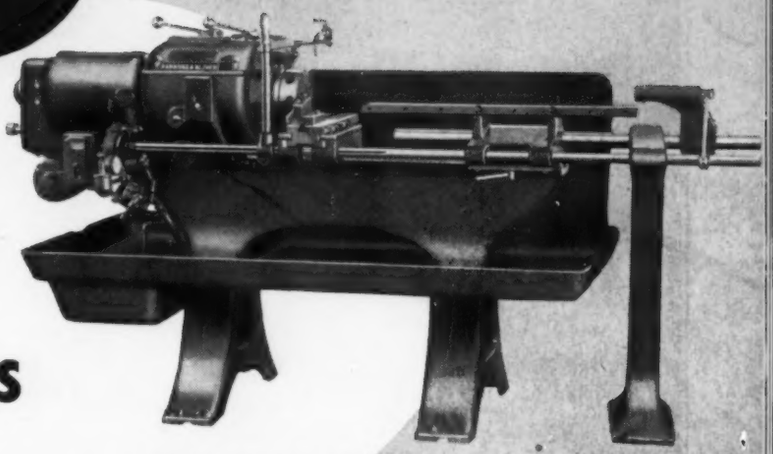
SADDLE TYPE UNIVERSALS
(No. 22 pictured)
No. 21:—Bar Capacities, heavy duty work 2½" x 36", average duty work 3" x 36", swing 21¼"
No. 22:—Bar Capacities, heavy duty work 3½" x 42", average duty work 4½" x 42", swing 25¼"

BARDONS & OLIVER, INC

& OLIVER

HYDRALECTRIC AUTOMATIC, SEMI-AUTOMATIC AND HAND OPERATED

CUTTING-OFF MACHINES

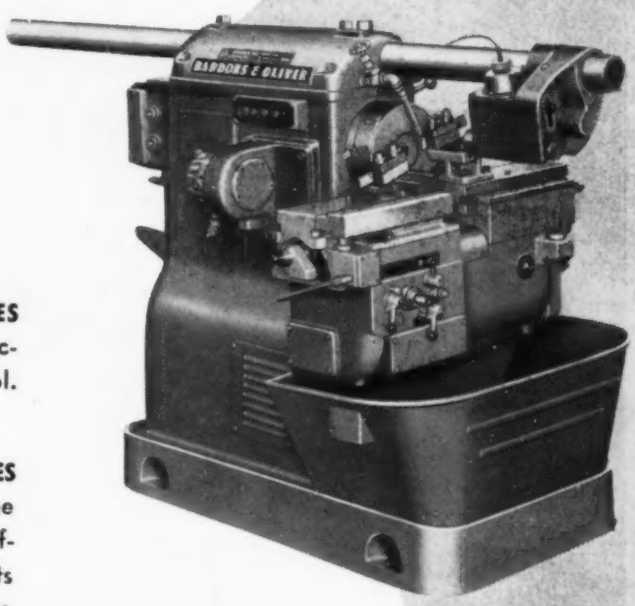


2 INCH HAND OPERATED CUTTING-OFF MACHINE

THIS, THE LARGEST LINE OF CUTTING-OFF MACHINES BUILT, covers a range from one inch to 26 inches. It includes hydralectric automatic, hydraulic single cycle and hand operated machines for chamfering, cutting-off, and cropping, bar stock, tubing and pipe.

Each size in the line is outstanding for its range of work. Look these machines over and note how they can increase your production.

THE 1 INCH AND 2 INCH HAND OPERATED CUTTING-OFF MACHINES synchronize the gripping and the feeding of the stock with the function of the receding stock stop and the action of the cutting-off tool.

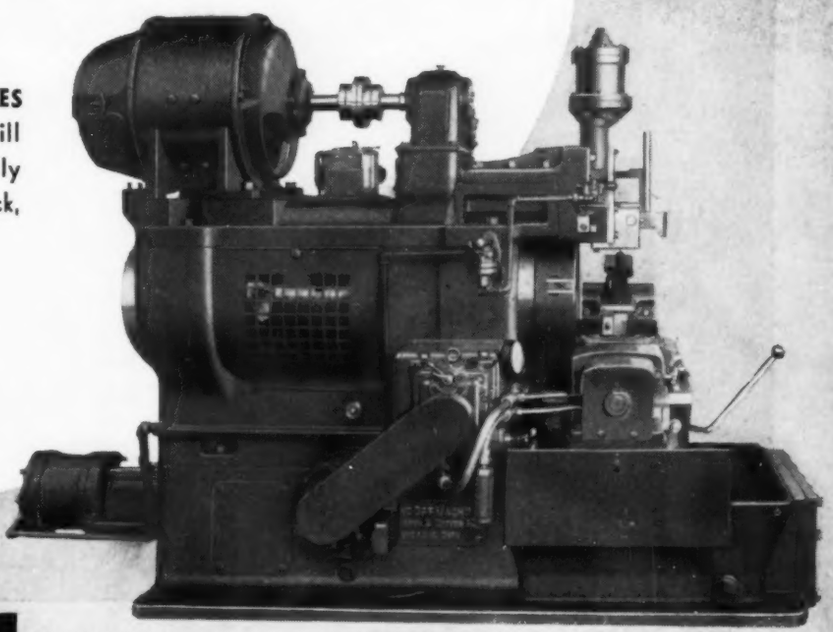


NO. 33 & NO. 34
HYDRALECTRIC CUTTING-OFF MACHINE

THE NO. 33, NO. 34, AND NO. 35 HYDRALECTRIC CUTTING-OFF MACHINES can be used either for fully automatic or single cycle work. With the collet chuck operated hydraulically the machines are entirely self-contained. Outstandingly rapid production is obtainable on parts chamfered and cut off from tubing, pipe or solid bar stock. These machines can also be built for automatic chucking work. Capacities are as follows:—No. 33, 3 inch diameter; No. 34, 4 inch diameter; and No. 35, 5½ inch diameter.

THE 8⅝ AND 14½ INCH TUBE CUTTING-OFF MACHINES are of the rigid, heavy duty, semi-automatic type for mill work. These rugged machines feature double hydraulically fed tool slides, power operated automatic collet chuck, and motor driven roller stock feed.

Larger sizes of cutting-off machines, up to 26 inch capacity, are built on special order to meet the customer's individual requirements.



14½ INCH TUBE CUTTING-OFF MACHINE

33 WEST 9TH STREET • CLEVELAND 13, OHIO

More Lathes mean | *Greater Choice Better Buy!*

THE R. K. LeBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

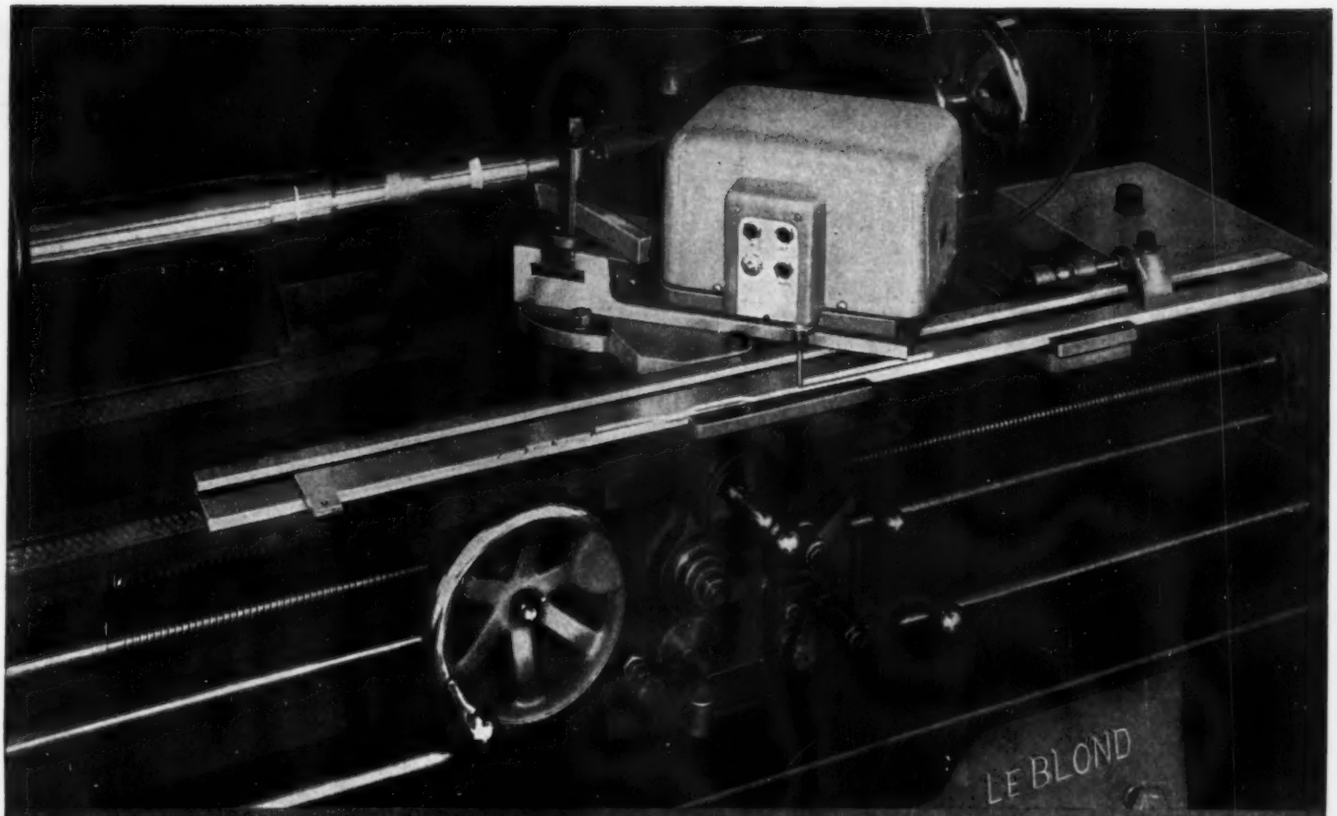
LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES

NEW YORK, Singer Bldg., 149 Broadway

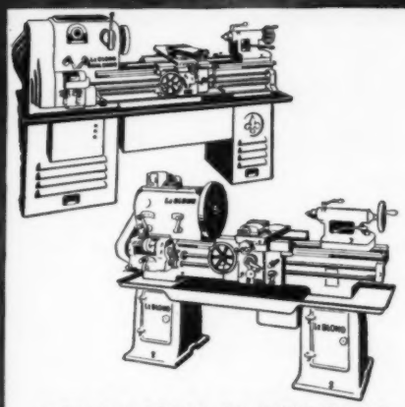
CHICAGO, 20 N. Wacker Drive

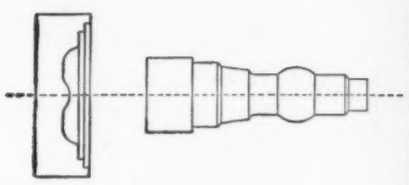
PHILADELPHIA, Beury Bldg., 3701 N. Broad

LeBLOND



★NEW LeBLOND ELECTRIC DUPLICATING ATTACHMENT





FITS ANY REGAL OR DUAL DRIVE

You can install the new LeBlond Electric Duplicator in 10 minutes time without drilling or fitting. It's available for any Regal or Dual Drive, any size, anywhere. Operates on the template-tracer principle, and is controlled by electric push buttons for "in", "out", and "automatic". No special skill is required to operate or set it up.

PLUGS INTO LIGHT SOCKET

You can put your new duplicator right to work, because no complicated wiring is necessary. It comes equipped with regular plug which can be snapped quickly into the nearest light socket for 110/115 volt 50 or 60 cycle single phase service. The LeBlond electric duplicator is easy to install, easy to use, and just as easy to remove.

PERFORMS ALL OPERATIONS

Duplicates profile facing or work between centers within .0015" to .002". On shaft work you can run this new device through every duplicating operation—straight facing and turning, tapers, shoulders, necking, concave, convex, and spherical surfaces—with one cutting tool, and without resetting. It's a time and labor saver in every respect.

No other duplicator offers you so many advantages. For further information write for illustrated bulletin today. Write Dept. EC-1, The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.

LeBLOND

new Bullard type "K" economies widen scope of MULT-AU-MATIC method

HIGHER SPEEDS, FASTER INDEXING, EASIER CHUCKING REDUCE TIME ON AND BETWEEN CUTS

Demand for a BULLARD Mult-Au-Matic capable of lowering production costs of small and medium sized jobs in cast iron, steel and light metal alloys such as aluminum and magnesium is now met by the addition of the new Type "K" to this versatile line of cost-saving machines.

Higher Speeds Meet New Job Requirements. Providing spindle speeds up to 900 rpm, the new Type "K" gets full productive capacity out of modern cutting tools. The wide range of available spindle speeds makes it adaptable for machining many different kinds of materials in sizes within its chucking capacity.

Saves Time Between Cuts. A newly developed index control mechanism permits faster return and advance of tool carrying heads and faster carrier index, materially reducing lost time between cuts.

Higher Degree of Accuracy. New method of carrier index registry insures maintenance of repetitive accuracy from station to station. This results in producing work to close tolerances in keeping with present-day requirements.

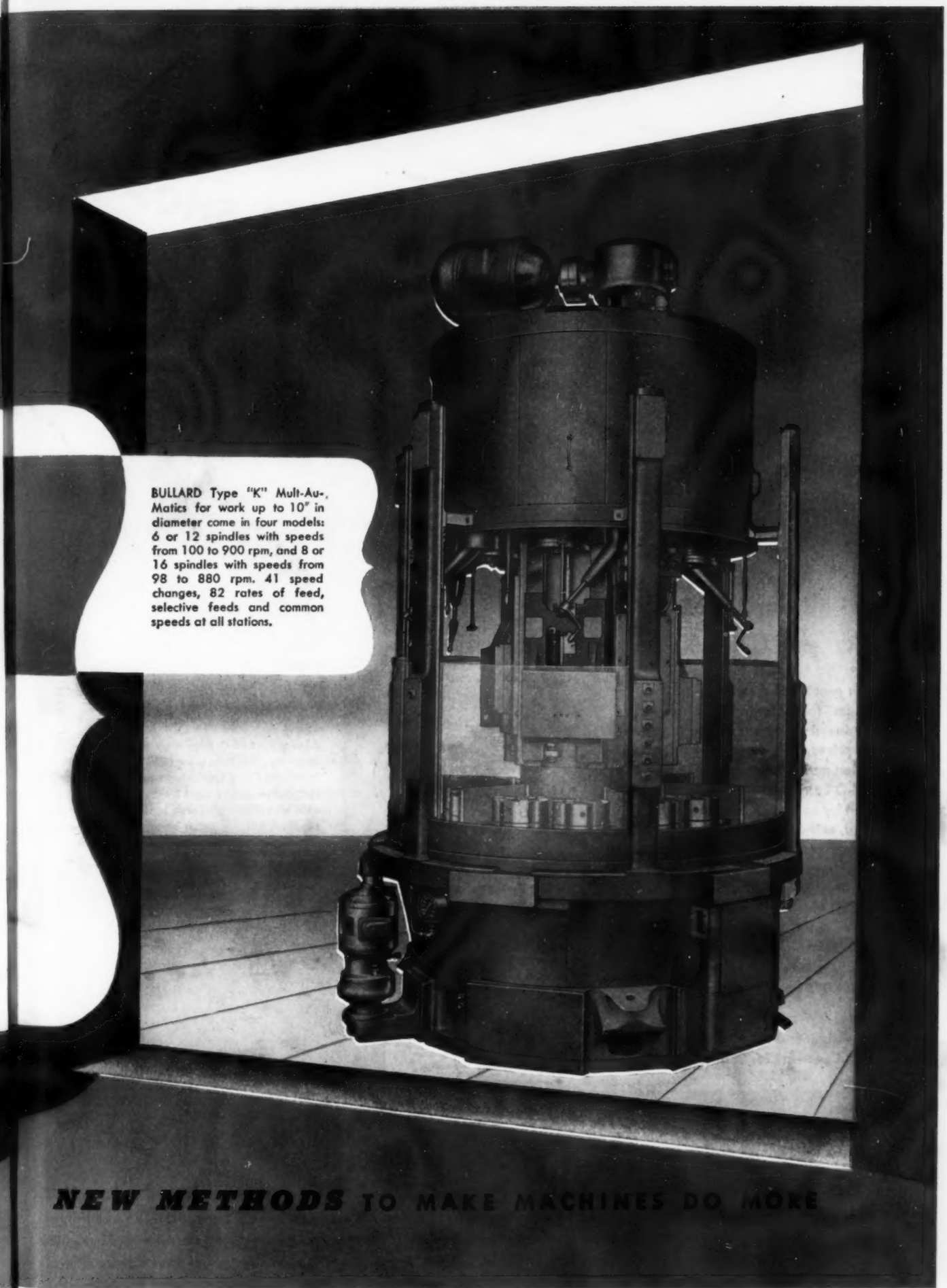
Improved Hydraulic Chucking Increases Efficiency. Work is chucked quickly by means of a foot treadle control and is automatically released when spindles are returned to loading station. Chucking pressure may be regulated to suit work characteristics.

Twin Spindles Double Production. To the four economies just described, common to all *four* Type "K" models, the twin-spindle models add the extra advantage of delivering two finished pieces for every index cycle. This promise of lower production cost is worth investigating further.

Many other advantages are inherent in the new Type "K" version of the Mult-Au-Matic method, one of the leading contributors to our modern American production system. Write for complete information. THE BULLARD COMPANY, Bridgeport 2, Connecticut.

BULLARD

CREATES



BULLARD Type "K" Mult-Au-Matics for work up to 10" in diameter come in four models: 6 or 12 spindles with speeds from 100 to 900 rpm, and 8 or 16 spindles with speeds from 98 to 880 rpm. 41 speed changes, 82 rates of feed, selective feeds and common speeds at all stations.

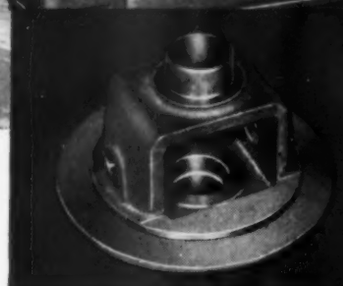
NEW METHODS TO MAKE MACHINES DO MORE

MODERNIZE YOUR SHOP ...Cut your Costs!

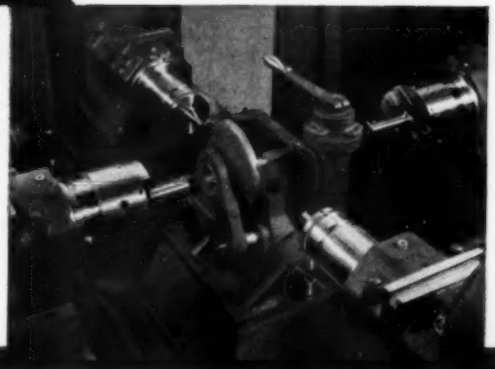
You Can't Make 1948 Products Economically on Old Equipment

Producing in greater quantity at a lower unit cost is "a must" today for production men . . . to offset increased man-hour costs and to meet competitive prices. One direct way to streamline production and to cut costs is to modernize with Ex-Cell-O Semi-Special Way Machines—they are built by combining one, two, three or four standard, self-contained way units with a fixture unit to suit the individual work. These Ex-Cell-O Precision Machines offer four definite advantages: *A special machine to suit the work—it's actually built for the specific job; holes bored simultaneously from 2, 3, or 4 sides—speeds production; low first cost—built up from standard units; way units can be re-arranged to suit new work—machine won't be obsoleted by part changes.*

Note typical use of an Ex-Cell-O Way Machine to the right. Send for catalog with many varied applications—ask for Bulletin No. 31631.



***Above:* Ex-Cell-O Four Way Precision Boring Machine. The four way units are electrically interlocked and controlled from the push button station on the right front unit. *Left:* Malleable iron differential case in which two inside counterbores are finish bored and chamfered and two cross holes are bored.**



***Right:* Close-up view of part in fixture and boring spindles. Note that boring bars on left front and right rear spindles are carried on tool slides that are retracted to allow tools to enter holes, are moved out to finish inside counterbores, and again retracted for withdrawal.**

XLO
EX-CELL-O *for* PRECISION

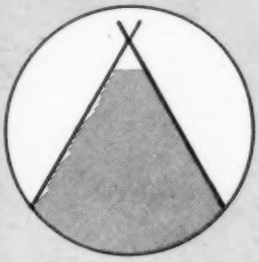
EX-CELL-O CORPORATION
DETROIT 6, MICHIGAN

Special Multiple Way-Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines, and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches, Broach Fixtures and Broach Grinders • Counterbore Sets • Grinding Spindles • Hydraulic Power Units • Drill Jig Bushings • R.R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment • Aircraft and Miscellaneous Production Parts

Facts about GAGES

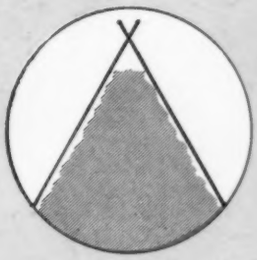
Most gages look alike, but some gages will outwear others many times. *Why is that?* The answer is something which cannot be seen by the naked eye. It is in the *finish* of the surface of the gage.

The *long-wearing* gages have surfaces that have been ground *AND LAPPED*. For example, if you magnified the profiles of the threads of gages, you could see the difference.

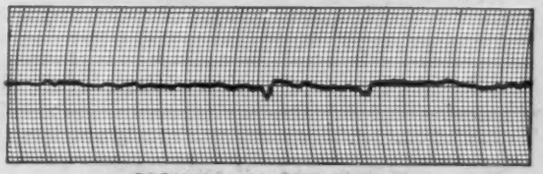


◀ This gage has been ground **AND LAPPED** to give many points of surface contact which insures longer gage life.

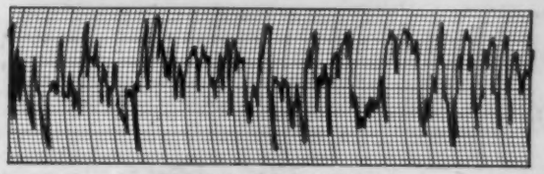
But this gage has ▶ **GROUND ONLY** finish, resulting in fewer points of surface contact and an early loss of accuracy.



This difference is even more apparent when the two finishes are compared by means of a Surface Analysis Graph.

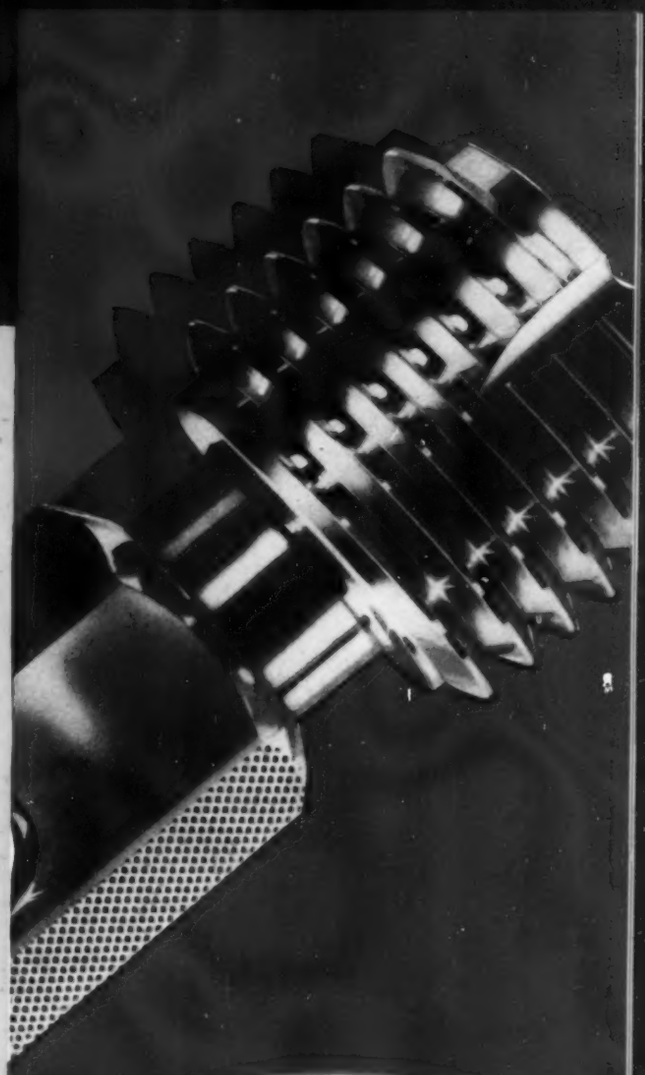


GROUND and LAPPED SURFACE



GROUND ONLY SURFACE

This is an important fact for buyers of gages to know. GTD "Greenfield" Gages are ground AND LAPPED to an extremely high degree of finish. This "inbuilt" extra wear gives long and accurate service and better value to users—one reason for GTD "Greenfield's" reputation as a maker of fine gages.



GTD

GREENFIELD

World's Leading

THREADING TOOLS

When you buy GTD "Greenfield", you get a quality of product that comes from the world's largest, most modern threading tool plant and its research staff of threading engineers—PLUS SERVICE from the leading distributors and GTD "Greenfield's" field men in every industrial center.

GREENFIELD TAP and DIE CORPORATION

GREENFIELD MASSACHUSETTS

Precision THREADING TOOLS

GEOMETRIC

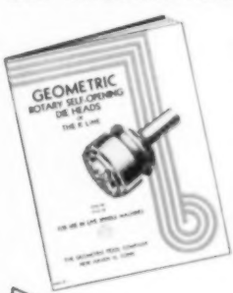
STYLE KD Rotary Self-Opening DIE HEAD

Modern machine work demands unfailing accuracy!

If you're looking for a compact, sturdy tool for fast threading — here's your answer. The Geometric Style KD Rotary Die Head is simple to operate, easy to take apart and reassemble, and capable of long, accurate service under demanding conditions. Its very simplicity makes this tool first choice among thousands of manufacturers for work on live spindle machines, particularly MULTIPLE SPINDLE automatic screw machines. The KD Die Head occupies little space on the machine. Strong solid metal backing at all points of stress insures its durability.

The chasers project beyond the front of the head, allowing close to shoulder threading without removing face plates or substituting projection chasers. This unique Geometric feature plus many others saves time and expense in close to a shoulder work. KD heads are available in six sizes, with a cutting range from 1/16" to 2". ***For the complete free story on the many practical advantages of using Geometric's KD Rotary Self-Opening Die Heads just mail the handy coupon today!***

USE COUPON FOR FREE INFORMATIVE BULLETIN NO. K-3



THE GEOMETRIC TOOL COMPANY
7 Valley Street
New Haven 15, Connecticut

Please rush me a copy of Bulletin No. K-3 which describes in detail the many advantages of the Geometric Style KD Rotary Self-Opening Die Head.

*Name*_____

*Firm*_____

*Street*_____

☐ *Bus.* ☐ *Res.*

*City*_____ *Zone*____ *State*_____

THE GEOMETRIC TOOL COMPANY - NEW HAVEN, CONN.
A Division of Greenfield Tap and Die Corporation

ELECTRONIC HEATER CUTS COST 63% . . . DOUBLES HATCHET-HARDENING OUTPUT

THE JOB . . .

An operation essential to the manufacture of hatchets at Mitchell and Unsinn Company, Washington, D.C., is heat-treating, in order to harden the blade and head surfaces.

THE OLD METHOD . . .

Hatchets were conveyor-fed through a preheating zone, an open gas flame for differential heating, and finally into a receiving cage, immersed in an oil bath. After hoist-dumping into a bin, each hatchet was cleaned. If heads also required tempering, the entire process was repeated. To perform these operations, three workmen were required.

THE *NEW* INDUCTION METHOD

An operator now positions the hatchet blade in the work coil of a G-E 20-kw electronic heater, where each blade is uniformly hardened and automatically quenched in a matter of seconds. If the head is to be hardened, the timing controls are reset and the head is run through. Cleaning operations are no longer necessary.

HERE'S WHAT INDUCTION HEATING HAS DONE FOR THIS COMPANY—

1. **Cut Costs**—Former methods, requiring 3 men, were estimated to cost $3.80 per hour; the induction method with only one operator has a total hourly cost of $1.39.
2. **Increased Production**—Former methods produced 650 blades per day, while 1300 are now realized with the induction method.
3. **Reduced Floor Space**—With the compact, automatic electronic heater, bulky handling and conveyor equipments are no longer required.
4. **Better Working Conditions**—The induction installation is clean, cool, and convenient. No more high ambient temperatures or oily floors.

WHAT CAN INDUCTION HEATING DO FOR YOUR PRODUCT?

We would welcome the opportunity to give you an unbiased answer to this question. Simply get in touch with the Heating Specialist in the nearest G-E Office. In the meantime, send the coupon for our free bulletins GES-3290A, "The How and What of Electronic Induction Heating," and GEA-4637, "G-E 20-kw Electronic Induction Heater."

GENERAL ELECTRIC

Apparatus Department, Sect. E675-172
General Electric Company
Schenectady 5, N. Y.

Please send me your free bulletins GES-3290A, "The How and What of Electronic Induction Heating," and GEA-4637, "G-E 20-kw Electronic Induction Heater."

Name.....

Company.....

Address.....

City.....State.....

RIVETT

MACHINES

FOR TOOLROOM AND PRODUCTION

PRECISION CABINET LATHES. Used for turning operations without power feed. Many attachments extend work range.

Two sizes: Series 715 with 7″ swing, 15″ centers. Series 918S with 9″ swing, 18″ centers.

PRECISION TURRET LATHE. Produces small and medium-sized parts from bar stock or on second operations. Series 918S with 9″ swing, infinite spindle speeds to 4,000 r.p.m., stationary collets up to $\frac{7}{8}$″ dia. or draw-in collets up to $1\frac{1}{8}$″ dia.

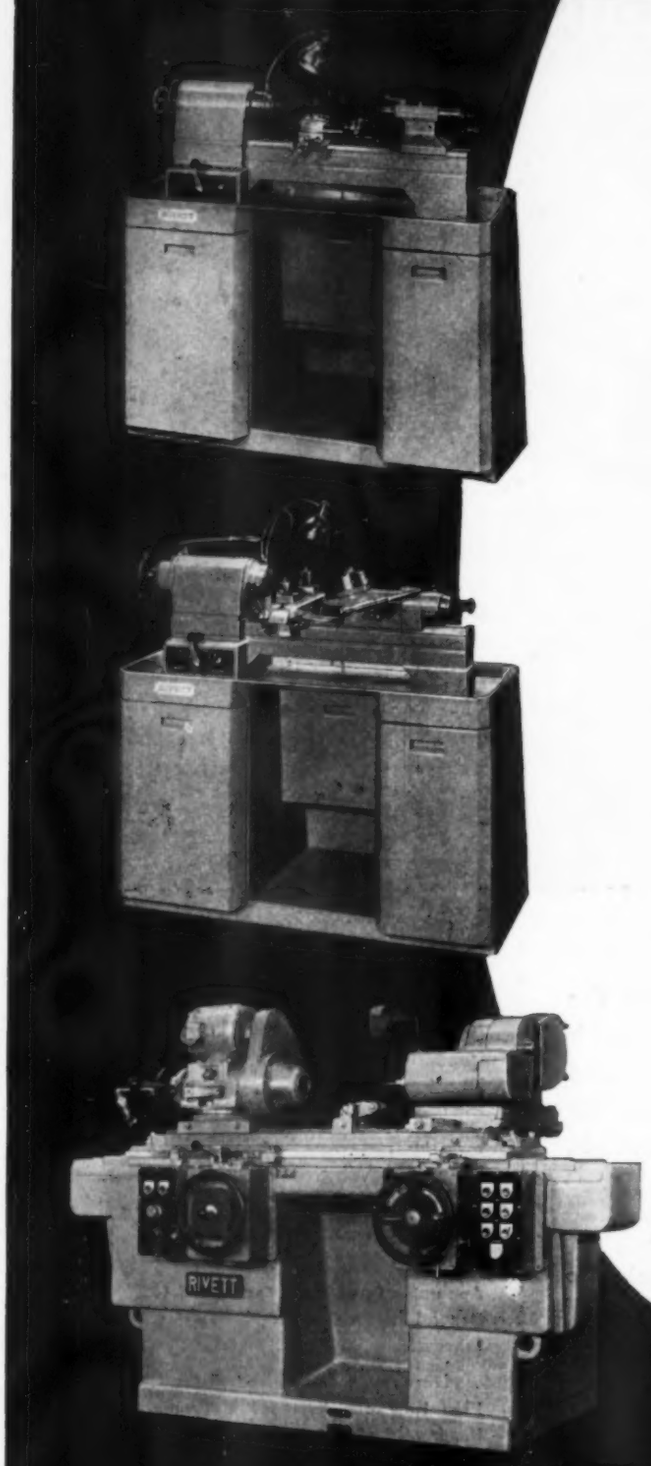
PRECISION TOOLROOM GRINDERS. Suitable for die and tool making as well as precision manufacturing. For both internal and external grinding.

Three sizes: Series 104 for work up to 3″ dia. Series 112 for work up to 8″ dia. Series 1024 for internal up to 9″ dia., external up to 12″ dia.

PRECISION TOOLROOM LATHES. For finest metal turning in any toolroom, experimental shop or laboratory

Two sizes: Series 608 with $8\frac{1}{2}$″ swing, 18″ centers. Series 1020R with $12\frac{1}{2}$″ swing, 24″ centers.

Write for descriptive literature.



RIVETT LATHE & GRINDER
INCORPORATED
BRIGHTON • BOSTON • MASS. • U.S.A.

PRODUCTION *Accessories to Lower* COSTS

THREAD TOOL

Mounts on any screw cutting lathe and replaces single point thread tools and chasers. Indexing system presents each of ten cutter teeth successively to the work allowing maximum cuts to produce a perfectly formed thread. Duplicates threads without gauging. Write for Bulletin 110.

LOCKJAW

New all purpose work clamp eliminates expensive bolting operations on millers, planers, grinders and drills. Stops work heaving, shimmying, yawing and buckling with sure-grip, locking pressure forward and downward. Write for Bulletin 140.

COLLETS

Lathes, milling machines and other tools can readily be equipped to use Rivett draw-in collets and step chucks. This self-centering, convenient method of chucking reduces time and increases precision on tool-room and production work. Write for Bulletin 100.

RIVETT

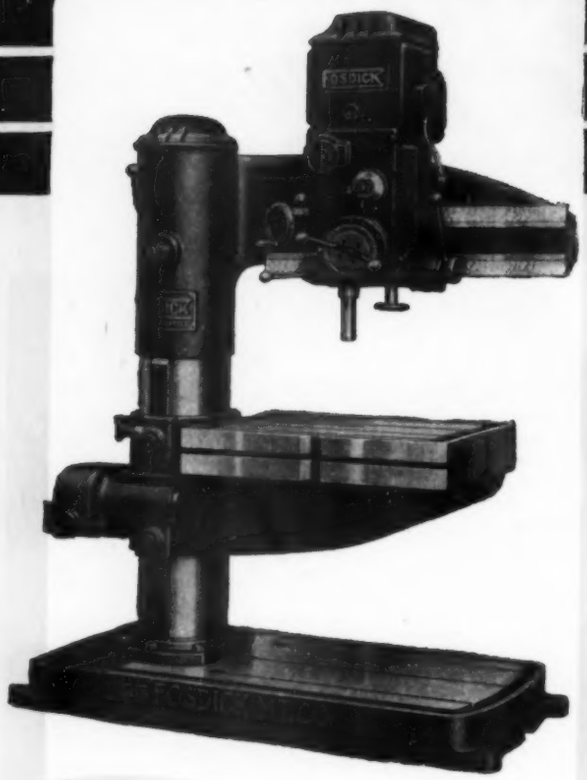
RIVETT LATHE & GRINDER, Inc.

BRIGHTON • BOSTON • MASS. • U. S. A.

FOSDICK

COVER PRECISION AND

ON A WIDE



1.

1. The new Fosdick Sensitive Radial built in 3′ and 4′ sizes.

2. New Simplified Radial built in 3′, 4′, 5′ swing, 11″ column sizes.

3. Improved Hydraulic Radial built in 13″ and 19″ columns.

4. Fosdick Economax Upright Drill furnished with box and round columns.

5. Fosdick four spindle High Speed Drill.

6. Fosdick improved Jig Borer.

7. New 21″ B. M. Fosdick Upright Drill.

2.

3.

MACHINES

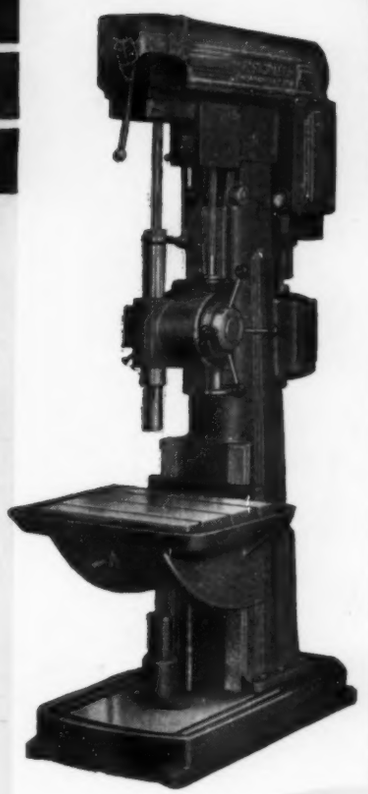
PRODUCTION REQUIREMENTS

RANGE OF WORK

● The Fosdick line of machine tools provides machines for drilling—reaming—boring and facing. It includes Jig Borers for precision operations in the tool room and tool and die shops, Hydraulic Radial Drills in types and sizes to meet your requirements. The new Sensitive Radials, which combine the advantages of both the Sensitive and Radial Drills, provide a high speed sensitive machine for radial work.

Sensitive Drills in single and multiple spindles up to six, are also included in this line. For high production, a single purpose Sensitive with one speed and one feed has been added —Standard Sensitive Drills are equipped with six or nine speeds. Medium and heavy duty Upright Drills are obtainable in box or round column sizes. Special production features can be added to any one of the Fosdick machines.

Consult a Fosdick Representative on your precision and high production requirements for ultimate satisfaction and economy.



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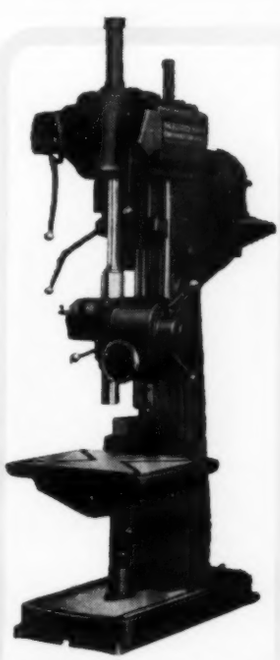

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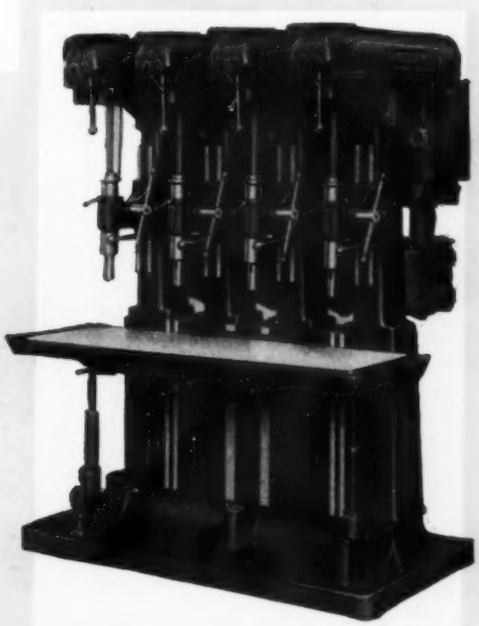

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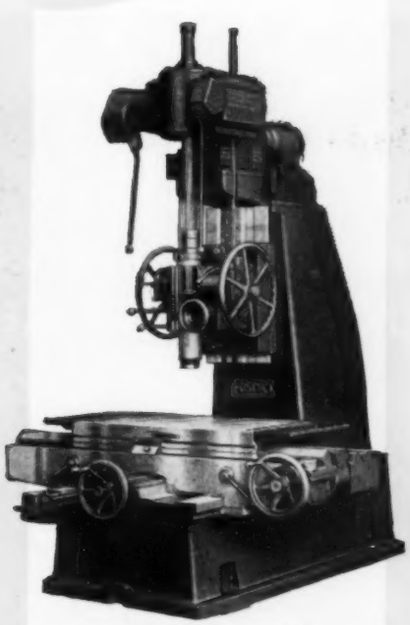
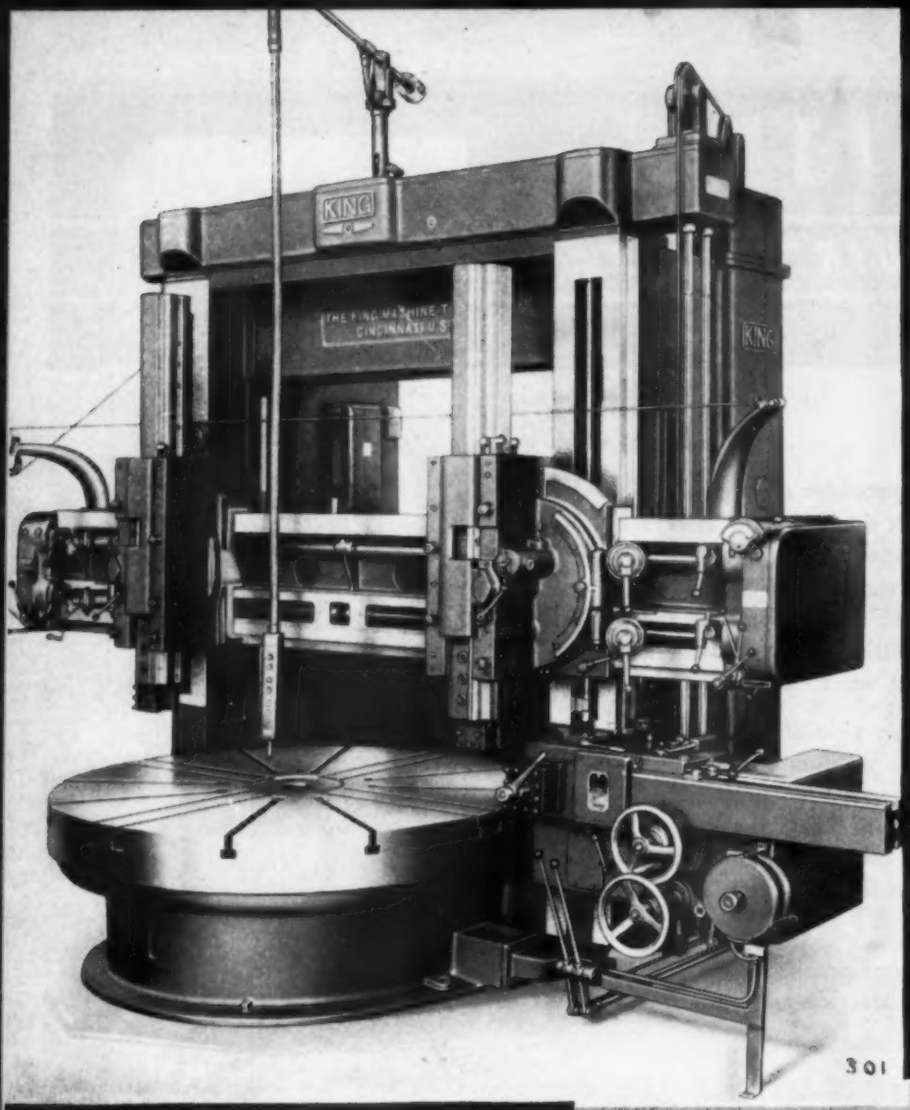


6.

THE Fosdick MACHINE TOOL COMPANY
CINCINNATI 23, OHIO

The New
VERTICAL



1 — 100" King with two swivel rams and side head

2 — 72" King with two swivel rams and side head

3 — 52" King with L. H. swivel ram, R.H. swivel turret and side head

4 — 42" King with R. H. swivel turret and side head

5 — 30" King with R. H. swivel turret and side head

1

2

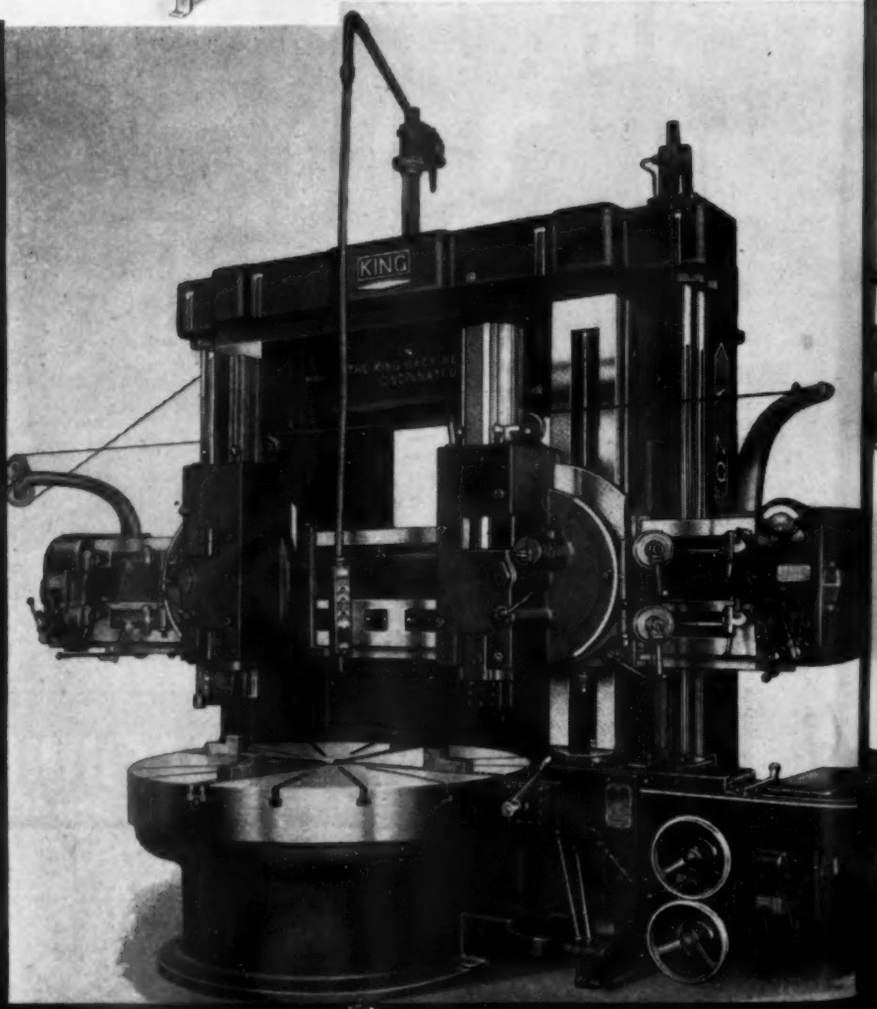
KING

VERTICAL BORING & TURNING MACHINES

are furnished in ten sizes to meet every operating need

SINGLE COLUMN
30" – 36" – 42"

DOUBLE COLUMN
52" – 62" – 72" – 84" – 100" – 120" and 144"

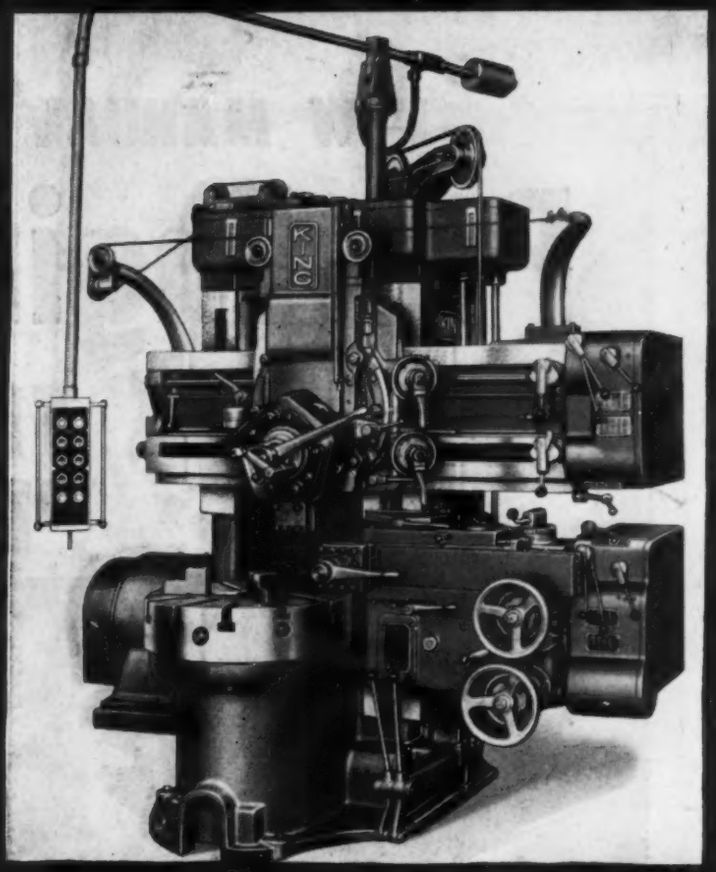


...w Series KING
A...ORING & TURNING MACHINES

● King builds the most complete line of general purpose vertical boring and turning machines available today. Whether your work calls for boring —turning—facing or a combination of these operations, whether it requires the use of carbide tools, whether it's a small or large job—there's a KING New Series Machine that will handle it faster—easier—and at lower cost.

Investigate the new series KING.

5



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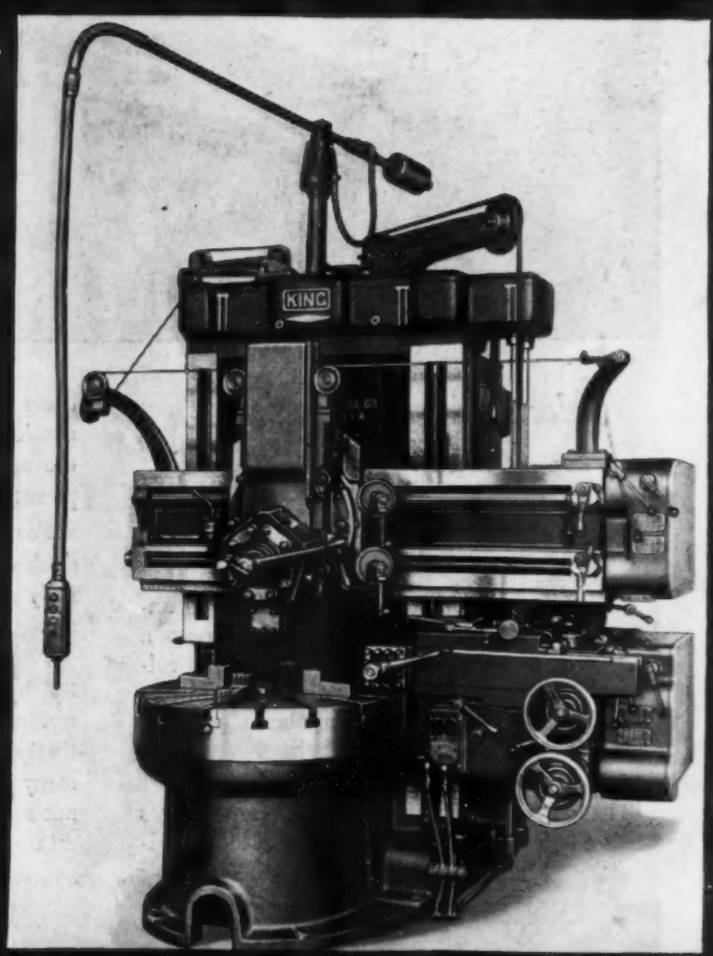

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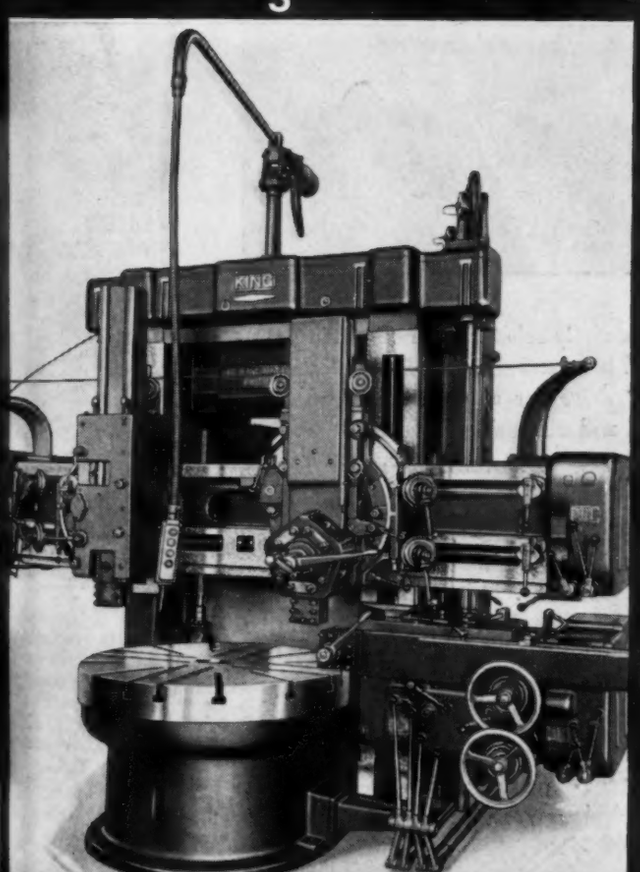


2

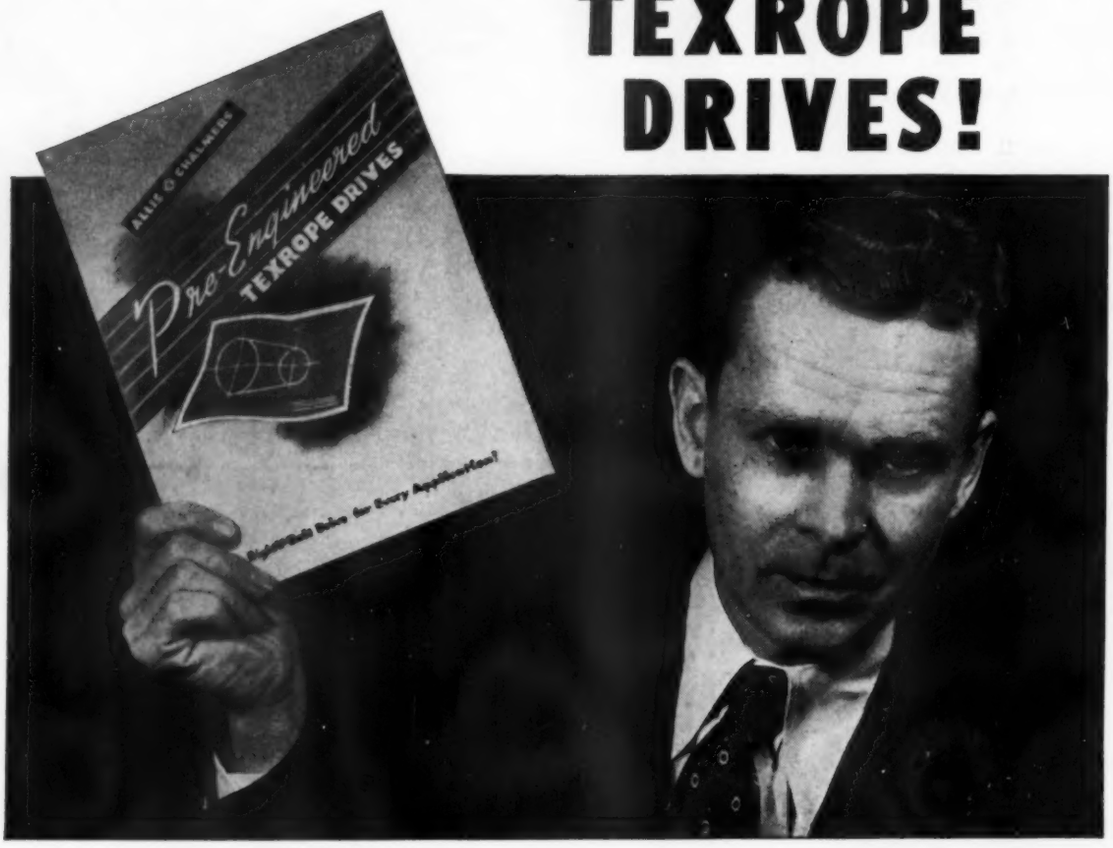
THE KING MACHINE TOOL COMPANY

CINCINNATI 29, OHIO

Builders of Vertical Boring and Turning Machines and Sebastian Lathes

NEW MANUAL PRESENTS

Pre-Engineered TEXROPE DRIVES!



Selects Most Economical Drive for Any Installation!

NEVER BEFORE has specification of the *right* V-belt drive been made so simple, so unerring. You turn to a page, run down a column, and there, in *one place* is the drive you need . . . number of grooves, diameters of sheaves, size of belt. No turning from table to table, no figuring.

These *Pre-Engineered* stock Texrope drives cover 90% of all requirements. Texrope engineers have carefully selected each one, using economical *stock* belts and sheaves. Each selection is the *one best drive* for a given requirement of power, speed and dimension.

For the few cases not covered by *Pre-Engineered* stock drives, the manual provides complete, carefully arranged engineering data to make it easy to figure special drives.

Now Available . . . 144 pages, indexed, size 8½ by 11 inches. The most complete V-belt drive manual ever published. A book that only Allis-Chalmers can give you. Copies have been sent to many Texrope dealers and users. If you have not received one, write for Texbook No. 20P40. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2333

TEXROPE .. Greatest Name in V-Belt Drives

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip" — sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.

SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

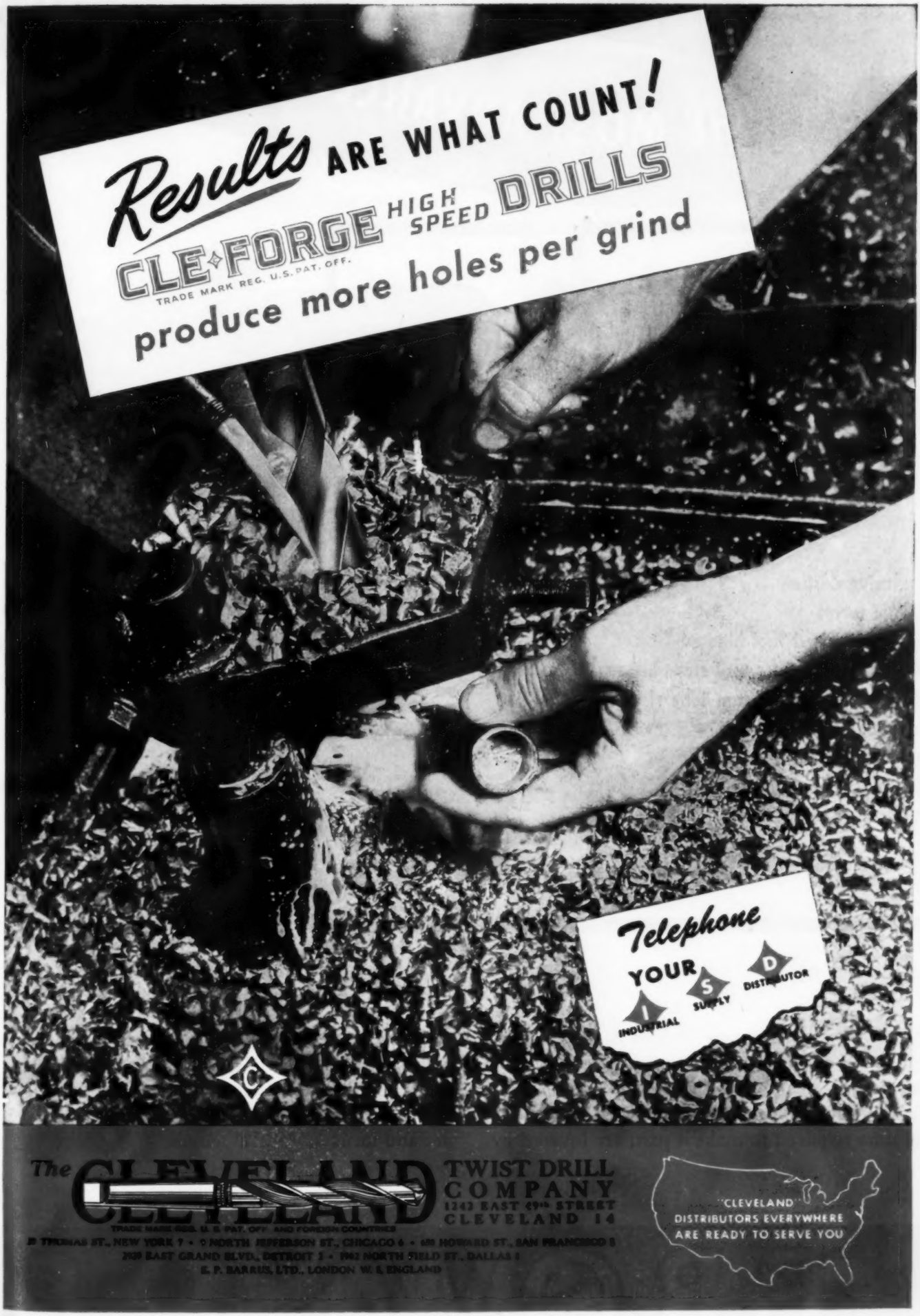
TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

Texrope, Super-7, Texsteel, Texdrive, Magic-Grip and Vari-Pitch are Allis-Chalmers Trademarks

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947
A CENTURY OF SERVICE to Industry THAT MADE America Great


Results ARE WHAT COUNT!
CLE-FORGE HIGH SPEED DRILLS
TRADE MARK REG. U.S. PAT. OFF.
produce more holes per grind
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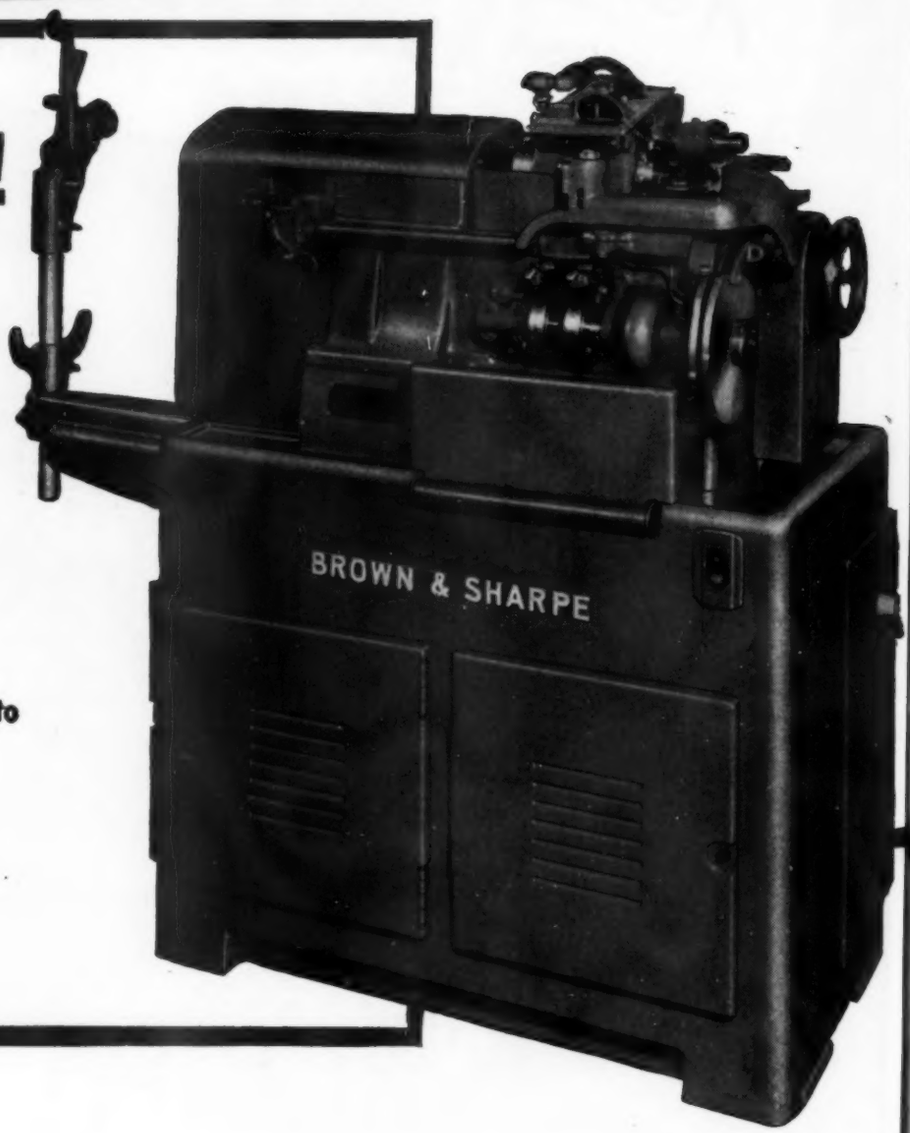
Here it is...

THE MOST ADVANCED DEVELOPMENT

UNIQUE! NEW!

AUTOMATIC PINION TURNING MACHINE



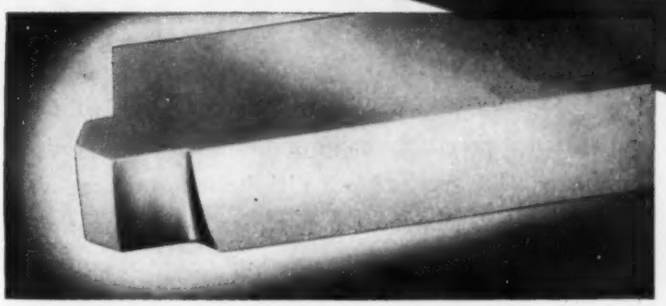
- Exclusive design
- 8-tool turret
- Circular-formed tool blades
- Positive micrometer tool stops
- Up to 4:1 ratio of cam lobe rise to longitudinal feed
- Single-point turning
- Turret axis parallel to work-axis
- Rigid work support

Now . . . with this new Brown & Sharpe Machine . . . consistent accuracy in staff and pinion turning is made practically automatic. Uniformly rapid automatic movements, regardless of time required to make a part, are insured by a constant speed drive shaft. Change gears provide rates of production from 3 to 364 seconds for one piece per cycle. 16 spindle speeds, from 10,000 to 910 r.p.m. Takes stock to ¼″ diameter and turns up to 2⅞″ length.

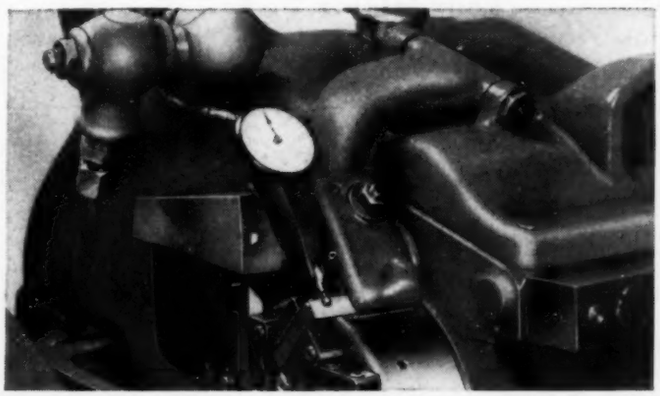
BROWN &

IN MACHINES FOR PINION and STAFF WORK

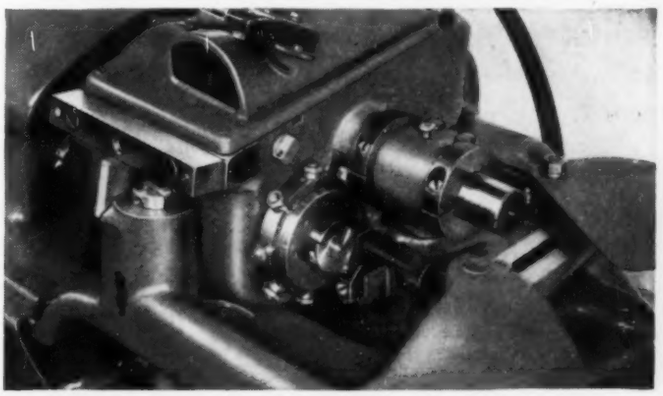
New Brown & Sharpe Automatic Pinion Turning Machine introduces new simplicity of set-up duplication . . . new, consistent accuracy of operation.



CIRCULAR-FORMED SINGLE-POINT TOOLS, an exclusive Brown & Sharpe development, retain exact original shape after resharpening by full-length surface grinding.



TOOL ADJUSTING DIAL INDICATOR on swing-arm permits accurate replacing of tool. Dial reading of original tool setting is duplicated simply when new tool is inserted.



INDIVIDUAL MICROMETER STOPS for each tool speed up original set-up and simplify accurate duplication when tools are replaced or reground.

ENTIRELY NEW DESIGN

A typical indication of the overall advances in design of the new Brown & Sharpe Automatic Pinion Turning Machine is the fact that *accurate operation can be maintained without highly skilled operators!* Accurate duplication of set-ups is made easier than ever before, by improved design . . . exclusive circular-formed single-point tools . . . built-in tool resetting indicator and centering gage . . . and individual micrometer stops for each of the 8 tool positions.

Another typical indication of the advanced design of this machine is its elimination of inherent mechanical sources of inaccuracy. Only 2 cams are employed in the drive mechanism . . . both mounted close together on the same drive shaft to eliminate torque distortion. And as much as 4:1 ratio of cam lobe rise to longitudinal feed further increases accuracy.

These are only a few of many features that contribute to the extraordinary efficiency of the new Brown & Sharpe Pinion Turning Machine for pinion and staff jobs. Write for complete information. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

SHARPE B·S

SUN "JOB PROVED" PRODUCTS CUT COSTS, SPEED PRODUCTION, IMPROVE QUALITY

Proof of the value of any industrial product lies in the experience that practical men have had with it. Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of various kinds.

To help you find solutions to problems in any of these fields, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking, without obligation. Telephone your local Sun office, or write Dept. AM-1.

SUN OIL COMPANY
Philadelphia 3, Pa.

"JOB PROVED" PETROLEUM PRODUCTS FOR INDUSTRY

SUN INDUSTRIAL OILS

SOLNUS OILS — Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in the machine tool industry, in air compressors, certain types of Diesels, etc.

SUNVIS OILS — Are in the same category as Solnus Oils with the difference that, in addition, they meet practically all paraffinic and high V.I. oil specifications.

OCNUS OILS — Low carbon-content oils, containing an additive which minimizes oxidation and gives detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse operating conditions.

DYNAVIS OILS — Low pour point inhibited oils which help prevent formation of harmful corrosive and sludge-forming acids. Well-suited for engines fitted with alloy bearings and operated at high temperatures.

SUNTAC OILS — 100% petroleum products which have been treated to increase their adhesiveness. Recommended for general lubrication in all industries where sudden shocks and reversal of loads take place. These oils cling to the parts to be lubricated.

CIRCO OILS — Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNISO REFRIGERATION OILS — Have extremely low pour points and long life stability characteristics. Initially neutral and resistant to formation of detrimental acids under service conditions. The most outstanding oils in the refrigerating and air-conditioning fields.

STEAM CYLINDER OILS — High flash and fire point lubricants for either saturated or superheated steam conditions and for worm gear speed reduction units.

SUN CAR JOURNAL OILS — Dark oils meeting A.A.R. Specifications. For use on railroad cars and waste-packed bearings of railroad equipment.

SUN DELAWARE OILS — Dark oils for general lubrication on older type industrial machinery.

SUNOCO WAY LUBRICANT — Has good metal-wetting and adhesive properties, ample viscosity and E.P. qualities. For use on tableways, as it eliminates chatter and scoring . . . resists corrosion.

SUN MARINE ENGINE OILS — Compounded with special emulsifying agents in order to provide adhesion to and lubrication of working parts in the presence of water. For the lubrication of bearings, eccentrics, cross-heads and various other parts of steam engines.

ROCK DRILL OIL — Heavy-duty adhesive type oil. For use in jack-hammers, stopers and drifters on heavy-duty mining operations.

SUNVIS 900 SERIES TURBINE OILS — High V.I., predominantly paraffinic oils, of uniform 0°F. pour points, containing additives to give high oxidation stability and corrosion resistance under practical operating conditions. Modern oils for turbine and hydraulic systems.

SUN INDUSTRIAL GREASES

SUN CUP GREASES — Water resistant. For grease cup and grease gun application when the service is not severe.

SUN GUN GREASES — Smooth greases made with medium viscosity oil. Stable under pressure in power guns or booster guns.

ADHESIVE PRESSURE GREASES — Won't drip or splash and are excellent lubricants for open gear applications.

SUN DARK PRESSURE-SYSTEM GREASES — For power-driven central grease lubricating systems in heavy industries. Can also be used as a "medium cup grease."

SUN MINE CAR GREASES — Available in several grades. Suitable for both anti-friction bearings and plain bearing cavity-type wheels.

SUN ROLLER BEARING GREASES — For use on electric motors and generators and other high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS — Black adhesive open gear compounds and wire cable greases. Recommended for open gears on metalworking power presses, mining machinery, old reduction mills, crushers, pump gears, etc.

SUN MINING MACHINE LUBRICANT — Semi-fluid. For use where a light but adhesive type grease is required. Free from separation or decomposition.

SUNOCO TRACTOR ROLLER COMPOUND — For miscellaneous parts of caterpillar or crawler-type tracks. Provides good lubrication with exceptional sealing qualities.

SUN METALWORKING OILS

SUNICUT — Straight or non-emulsifiable transparent cutting oils. Recommended for automatic screw machines and for heavy-duty machining operations.

SUN INDUSTRIAL

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion when mixed with water. Sunoco is an efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and non-ferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to develop maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel up to 550°F. Due to their low carbon content and stability under heat, these oils have an unusually long service life.

SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum and brass.

SUN ANTI-RUST COMPOUNDS—Petroleum base oils with chemical additives designed to prevent the rusting and corrosion of steel.

SUN PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" or fine air-borne particles of lint.

SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are not so readily damaged or broken down into harmful dust when this product is used.

SUN CORDAGE OILS—Are adaptable in various formulae used by cordage manufacturers. They are selected products which are highly compatible with additives.

CIRCOSOL—2XH (Rubber Processing)—An elasticator and processing aid for GR-S particularly.

CIRCO LIGHT PROCESS OIL (Rubber Processing)—A processing aid and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber particularly. Used for GR-S to some extent.

SUNDEX 53 (Rubber Processing)—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established outstanding processing aid for footwear rubber stocks.

CIRCOMAR-5AA (Rubber Processing)—A black colored product used in reclaiming natural rubber scrap. Used also as substitute for asphalt fluxes in processing natural and GR-S rubber. Free-flowing at room temperature.

SUN LEATHER OILS—Mineral base leather oils. Used for obtaining the desired tensile strength, proper temper and a controlled moisture content. They maintain a light even color . . . mix well . . . distribute evenly.

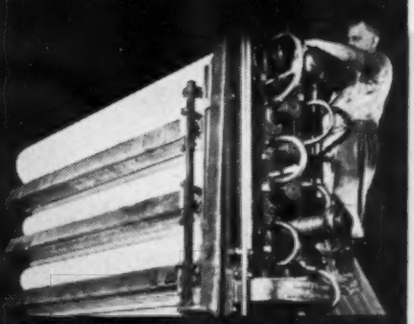
SUN MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SPIRITS—For the thinning of paints, varnishes, and enamels. Also for metal cleaning. This product is a pure water-white petroleum solvent and is free of corrosive sulphur.

SUN WAXES—Used in packaging, sealing, coating, waterproofing and for numerous manufacturing and chemical processes.

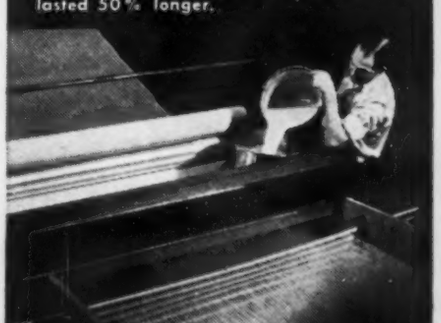
RUBBER MANUFACTURER saved $3,000 a year with a Sun Processing Aid.

ALUMINUM PARTS MANUFACTURER increased output 43% with Sun Cutting Oil.



PAPER MILL slashed annual lubrication bill $2,874 by using a Sun Grease.

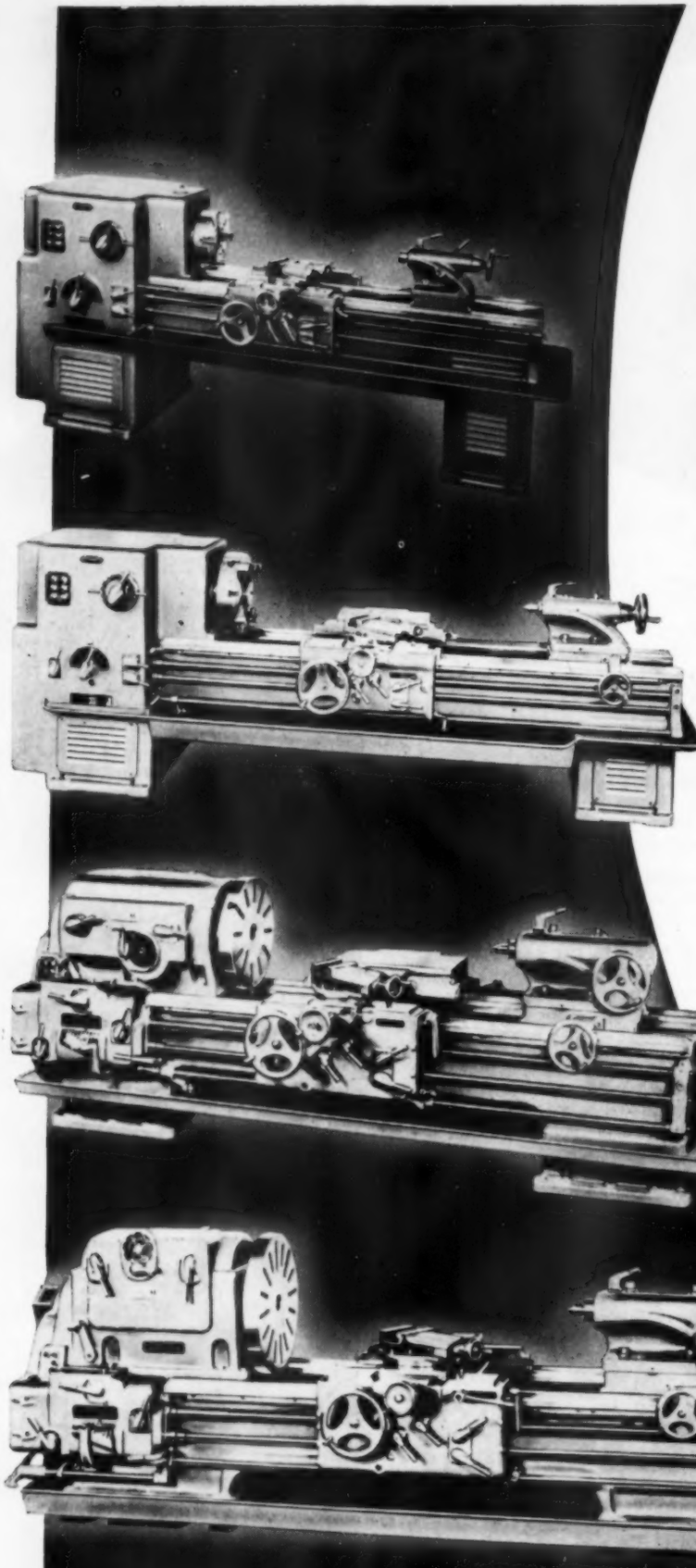
POWER PLANT found Sun Diesel Lubricant lasted 50% longer.



A TEXTILE MILL increased slashing speed 60% by adopting a Sun Processing Oil.

PRODUCTS

SUNOCO



Sidney LATHES

● Designed around sound engineering principles and produced by modern methods on up-to-the-minute equipment Sidney Lathes offer many cost saving advantages on all types of turning operations.

Rigidity is maintained by the four wall bed construction with double cross girts at close intervals. Anti-friction bearings throughout the headstock, end gear train, gear box, apron and all parts carrying radial or thrust loads, the smooth, silent power of the herringbone geared head all contribute to precision performance over long periods.

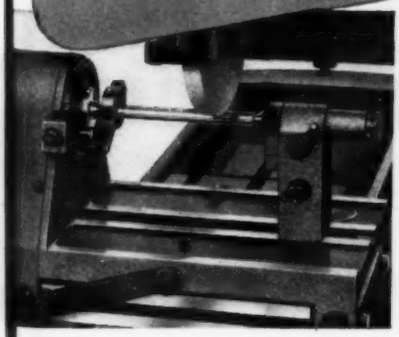
Make *your* next lathe a Sidney. Consult a nearby representative for details.

SIDNEY

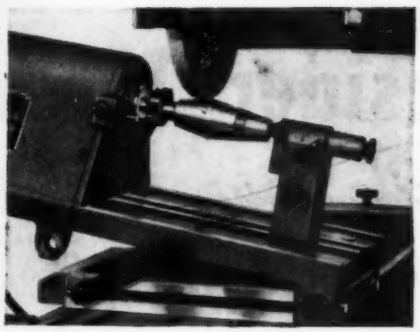
SIDNEY MACHINE TOOL COMPANY · SIDNEY, OHIO

Builders of Precision Machinery Since 1904

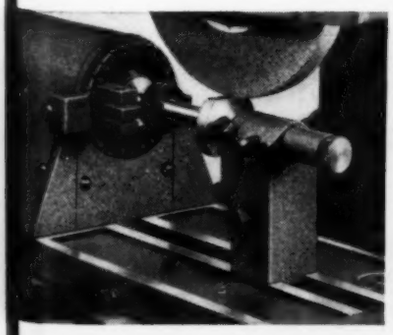
HERE'S A SIMPLE WAY to enlarge Your Grinding Facilities



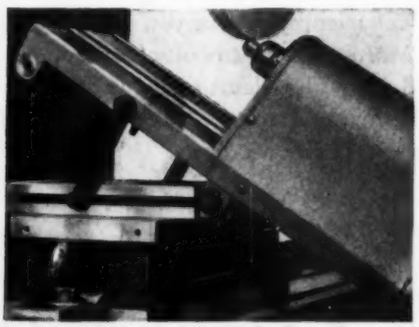
● Grinding work held between centers. Tailstock center is withdrawn for work change by simple swing of lever.



● Grinding taper shank. Attachment is readily adjustable to the desired taper.



● Grinding parallel flats using index plate. Index plate has 24 slots — is locked or released by plunger.



● Angular grinding of work held in spring collet. Attachment is held on permanent magnet chuck.

. . . for Surface Grinders

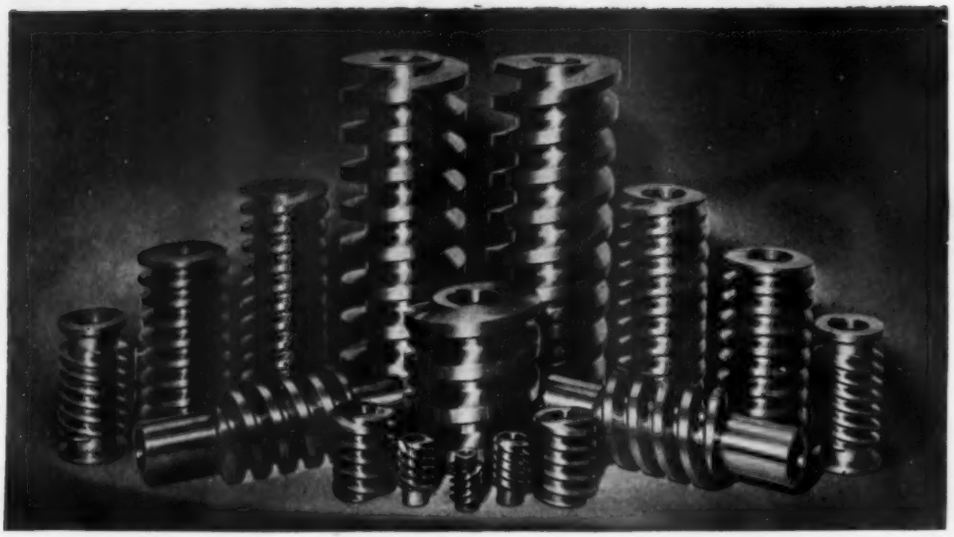
This new Brown & Sharpe Cylindrical Grinding and Indexing Attachment is designed to be used on surface grinders for dry grinding small cylindrical work, tapers and work requiring indexing. It is a simple way to enlarge your grinding facilities and may make unnecessary an investment in extra equipment.

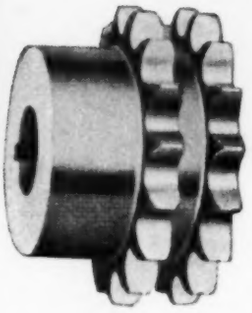
Straight cylindrical or tapered work is ground between centers or, if ½" diameter or less, can be held in indexing spring chuck. Indexing is performed with headstock index plate or with interchangeable indexing spring chuck.

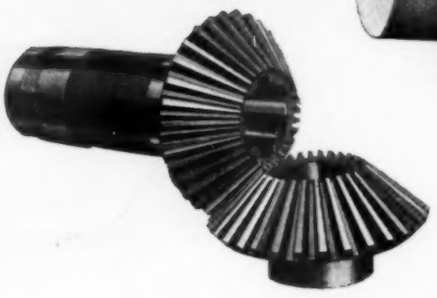
Centers swing 6" diameter; take work 5¼" in length. Maximum grinding angle, 45°. 1/60 H.P., 115V., A.C. motor is completely enclosed. Write for illustrated folder. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor

BROWN & SHARPE B·S







the ADAMS line

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- HELICAL GEARS
- BEVEL AND MITER GEARS
- WORMS AND WORM GEARS
- SPROCKETS
- INTERNAL GEARS (Spur and Helical)
- RATCHETS
- SPLINED SHAFTS
- RACKS
- LEAD AND FEED SCREWS
- GROUND TOOTH GEARS (Spur and Helical)
- SHAVED TOOTH GEARS (Spur and Helical)
- GROUND THREAD WORMS

Consider These Factors

while your product is still on the drawing board

Custom-made gears especially designed to fit your product will give you simpler, more efficient operation than is generally possible otherwise. Adams gears are produced on the finest, newest gear cutting machinery, by master craftsmen with long experience, to give you gears which conform precisely to your specifications. Moreover . . . smoother operation, greater accuracy, and longer life are insured through Adams quality control which includes rigid inspection at all stages of manufacture. Write for details: THE ADAMS COMPANY, 1942 Bridge Street, Dubuque, Iowa.

The ADAMS Compa

Dubuque, Iowa, U. S. A.

GEARS

FINE GEARS MADE TO YOUR SPECIFICATIONS . . . . . ESTABLISHED 1883

Free FOR THE ASKING

. . . THE NEW UNBRAKO SCREW Calculator

Reg. U. S. Pat. Off.

To operate: pull slide card from either end until desired screw diameter is encircled on upper edge . . . corresponding readings will then result as to socket and head diameter, head thickness and number of threads per inch whether NC (USS) or NF (SAE). Decimal equivalents on reverse side.

Yes, the new, time-saving "Unbrako" Screw Calculator is *yours for the asking!* Its simple design gives quick, accurate figures on standard types of "Unbrako" Socket Screw Products. This handy Screw Calculator (actual size shown above) is an ideal "help-mate" in office, drafting room or shop. It's easy to spot when you need it. And when you desire an easy run-down of the fractional-decimal or thread dimensions, you can just pick-up your "Unbrako" Calculator and save time.

It's always best to specify tough, dependable "Unbrako" Socket Screw Products — sold entirely through Industrial Distributors.

OVER 45 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

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AJAX

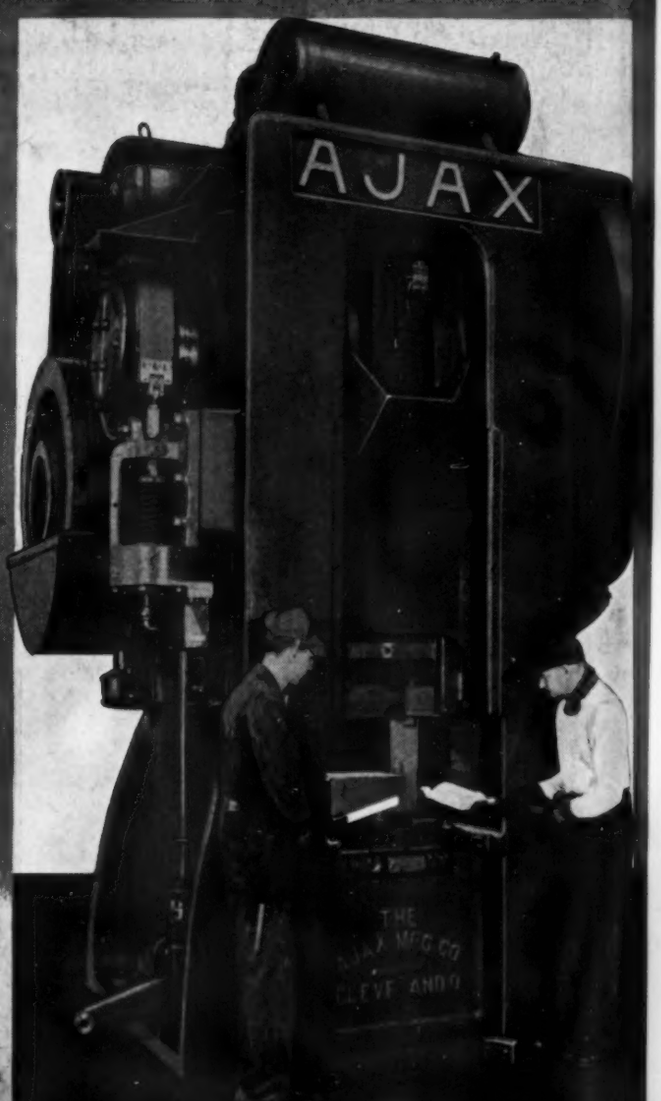
FORGING MACHINERY

For most efficient FORGING PRODUCTION

● Forging production efficiency is constantly becoming more vital to successful Forge Shop operation. Obsolete machinery or lack of the best machines for the work being produced is very often costly.

Ajax Forging Machines, Forging Presses and Forging Rolls are built on a basis of mechanical soundness embodying many exclusive, patented mechanical features. In the design and construction of this line of machinery, the recognition of the need for greater operating speed, greater ease of operation and a higher degree of accuracy in forging output, is constantly a guiding factor.

As a result, the forging production advantages afforded by these machines will be most valuable to many Forge Shop Operators during the competitive years ahead. Write today for bulletins.



THE AJAX MANUFACTURING COMPANY

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DEWART BUILDING NEW LONDON, CONN.

THE TOOLROOM TEAM that's *Right* on the job

Here are three associated machines that team up effectively for stepping up speed in busy toolrooms . . . preventing schedule tie-ups through their unusual versatility. Check their features!

PRODUCTO HAND TAPPER (Top) . . . gives tool and die men facilities to tap and ream at any point in the work within the table area. Bench types, capacities to ¼″ or ½″ taps; Pedestal type, up to 1″ taps.

PRODUCTO UTILITY PRESS (Left) . . . gives operator easy, precise control of up to 50 tons pressure for variety of punch and die work . . . even short broaching. Ask for full details . . . practically indispensable in any shop.

PRODUCTO PUNCH HOLDER REMOVER (Right) . . . a new machine built for a specific use . . . saves valuable diemaker's time, protects expensive punches and dies. Easy, fast separation of punchholder from die bed with pins . . . or assembled punches and dies . . . with or without shank. Ask for Bulletin on further details.

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ELMIRA 5168
ERIE 5-4375
INDIANAPOLIS Lincoln 5385
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NEW YORK Worth 4-7481
PITTSBURGH Atlantic 4116
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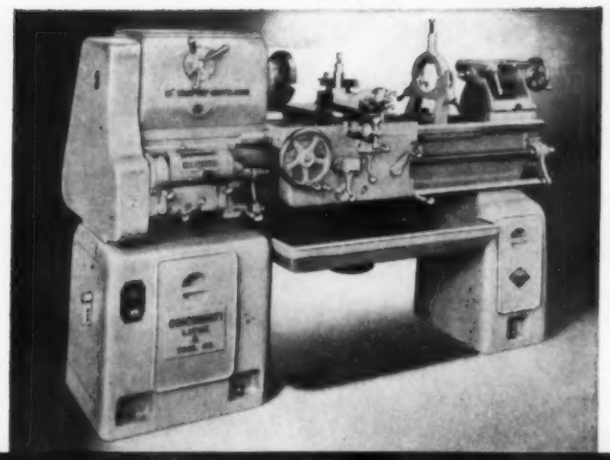
ST. LOUIS Newstead 0765
SAN FRANCISCO Exbrook 2-2230
SYRACUSE 3-1181
TORONTO Hudson 9071
YORK, PA. 2042

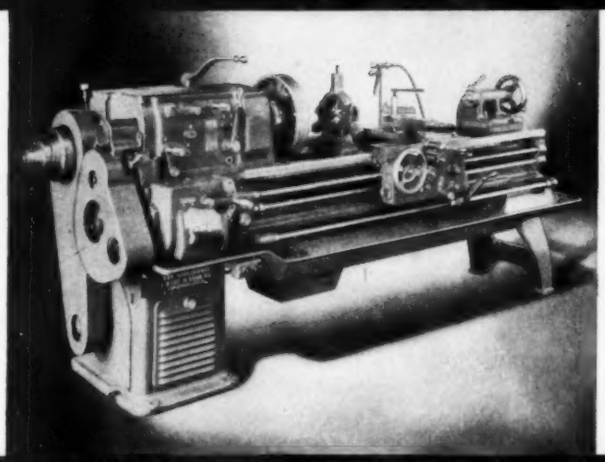
SPD 48



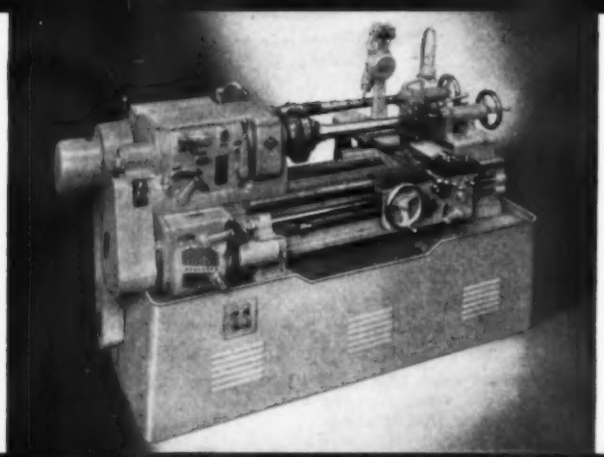
NEW TRAY TOP CINTILATHE, a light duty, low cost motor driven geared head engine lathe, offers features not usually included in lathes of their size and price range. Built in 10″, 12½″, 15″, and 18″ swing sizes, and distances between centers from 18″ to 60″, 12 spindle speeds, with an overall ratio of 41 to 1, 48 thread and feed changes . . . Standard Motor Drive 10″—1 HP., 12½″—1½ HP., 15″—2 HP., 18″—3 HP . . . Tray Top Cintilathes in 15″ and 18″ sizes available with gap, including gap block.

exceptional features at lowest cost

STANDARD CINTILATHES in six nominal swings 14″ to 24″, bed lengths providing distances between centers from 32″ to 238″, 12 spindle speeds—32 changes of threads and feeds. These medium duty low cost lathes handle a wide variety of turning, boring, and threading operations for long or short runs. They offer capacity for practically all of your lathe work with a minimum investment. All sizes may be furnished with gap, including gap block. A profit maker for general machine shops, small manufacturing plants, and maintenance and repair departments.



capacity for practically all your lathe work



NEW CONTOURMATIC CINTILATHE with feather-touch tracer control, turns multiple diameter shafts in small or medium production lots, automatically, accurately, and economically, and retains the full versatility of a standard engine lathe . . . Two machines in one. "Mike" once and all dimensions come true. Sensitive all hydraulic tracer control provides automatic duplication of master shape with high degree of accuracy. Supplied in same sizes as standard Cintilathes.

two machines in one, with feather-touch tracer control

NEW TRACERMATIC CINTILATHE is a special machine for use primarily on molds for bottles, tableware and other items in glass industry, embossing dies, dies for plastics, etc., where extreme accuracy, fineness of detail, and speed of production are required. The work need not be circular in cross section. Ovals, squares, rectangles, etc., with rounded corners and intricate patterns are readily produced.

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CINCINNATI LATHE & TOOL CO.

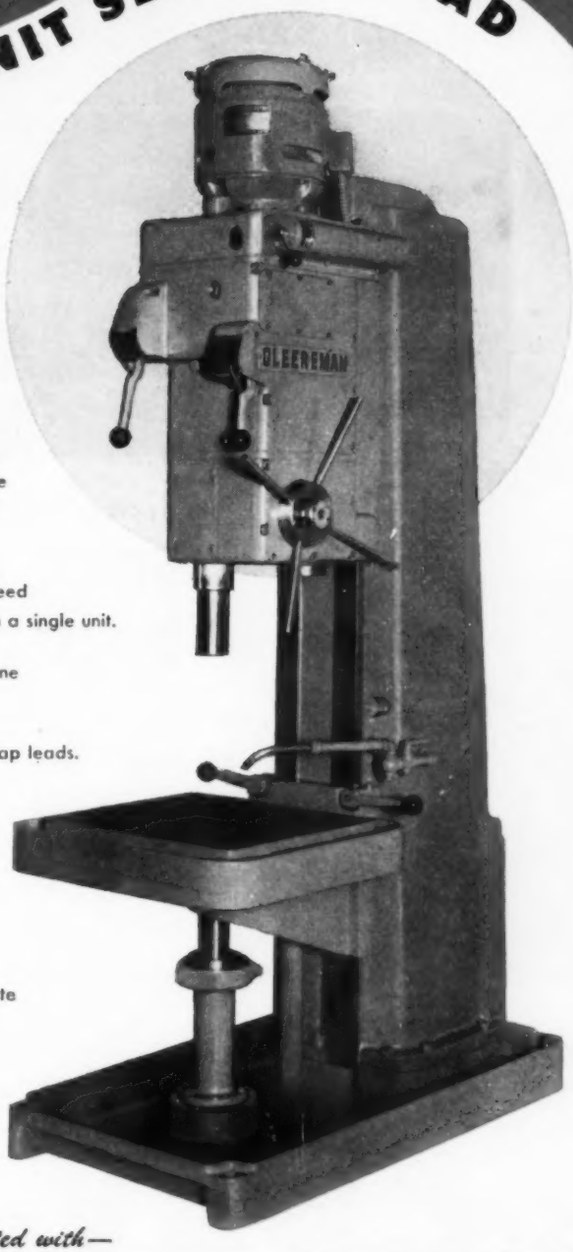
OAKLEY, CINCINNATI 9, OHIO • CABLE ADDRESS: CINTILATHE

NEW!

CLEEREMAN

325 SINGLE UNIT SLIDING HEAD

DRILLING MACHINES



employ time-tested, proven, engineering principles assembled in a new and different manner to secure simplicity of construction, extremely wide range of application and greater operating facility:

Fully enclosed Sliding Head includes spindle and feed mechanisms, motor and spindle feed transmission in a single unit.

Wide range of six or twelve spindle speeds combine extreme sensitivity with rugged strength.

Four quick change feeds. Wide range of geared tap leads.

Four position turret type feed depth stop.

plus the well-known Cleereman features of ease and simplicity of control, exceptional flexibility, easy set-up.

Wire or write today for catalog containing complete description and specifications.

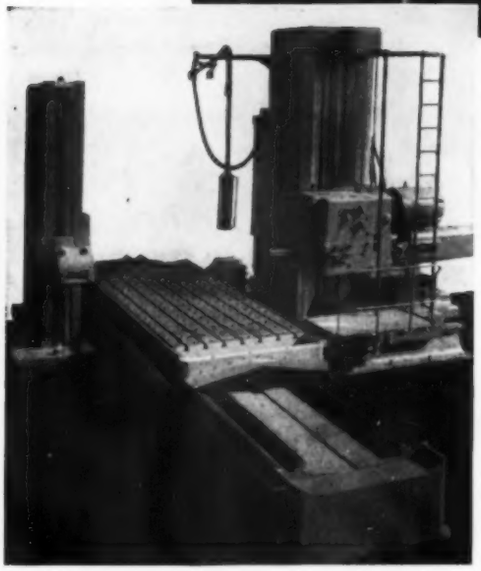
BRYANT Machinery & Engineering Company

General Office
400 West Madison Street, Chicago 6
Representatives in Principal Cities

Affiliated with—

CLEEREMAN MACHINE TOOL CO. Green Bay, Wis.

BUILDERS OF PRECISION JIG BORERS & DRILLING MACHINES



Simplicity of control features new GRAY PLANER TYPE BORING, DRILLING and MILLING MACHINE

A glance at the head and pendant switch of the new GRAY PLANER TYPE HORIZONTAL BORING, DRILLING AND MILLING MACHINE will convince you of the simplicity and almost self-evident means of control. This simplicity and convenience enables the operator to turn out more work with less physical and mental strain, for he handles the machine with complete confidence and a minimum of effort.

Write for fully illustrated descriptive Bulletin No. 54

The G.A. GRAY Company

planers • milling planers
planer type milling machines
horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.

SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES

Here's engine-lathe accuracy at screw-machine speed

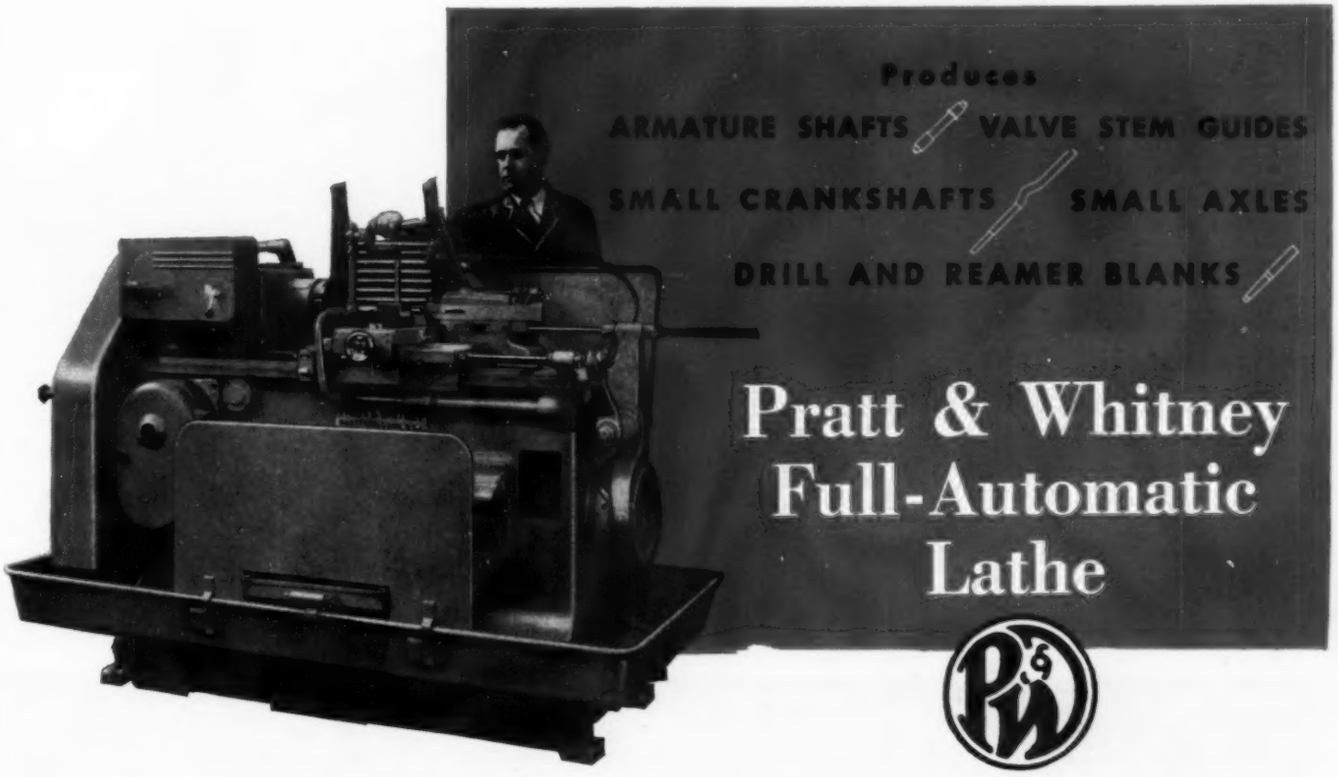
THE Full-Automatic Lathe does just what its name implies — multiple lathe operations performed *on centers* automatically. Pre-centered work* is fed from a magazine, held and turned accurately on centers, and discharged into a bin. Non-cutting time is reduced to the lowest point. The only "operating" needed is loading the work and normal cutting tool attention. And the tools can be either high-speed steel or carbide.

Here is the fast way to produce accurate small shafts, valve stem guides, and similar work (up to 1¼" diameter, 18" long). If the job is to be left soft, the machine will hold the needed close tolerances. If it is to be subsequently hardened and ground, you need to leave only enough stock to clean up tool marks and allow for hardening distortion. Thus the rough grinding operation is eliminated, and only a finish grind required . . . an additional saving.

The P&W Full-Automatic Lathe requires small floor space and lends itself well to operation in batteries with one operator to several machines. Write for complete information on this cost-cutting equipment. Pratt & Whitney, *Division* Niles-Bement-Pond Company, West Hartford 1, Conn.

* * *

*For high-production, uniformly accurate centering, use the P&W Full-Automatic Centering Machine. It's the companion machine to the Full-Automatic Lathe, and ideal for accurately centered work for other machines as well.



Accurate turning on centers *automatically*

ARMSTRONG

TOOL HOLDERS

answer both . . .

1. The problem of lowering costs
2. The problem of increasing output

By providing permanent, multi-purpose, inexpensive ARMSTRONG TOOL HOLDERS that use cutters or bits that are quickly ground from standard high speed shapes (Saving: All Forging, 70% Grinding and 90% High Speed Steel), the Armstrong System of Tool Holders will reduce your tool cost to an absolute minimum.

By providing stronger, more efficient tools, carefully developed for each operation, as well as ARMSTRONG High Speed Steel, ARMALOY Cast Alloy Cutter Bits or Armide Carbide-Tipped Cutters as required for each job, ARMSTRONG TOOL HOLDERS permit greatly increased speeds and feeds, enable you to increase the hourly output of every lathe, planer, slotter, shaper, turret lathe and screw machine.

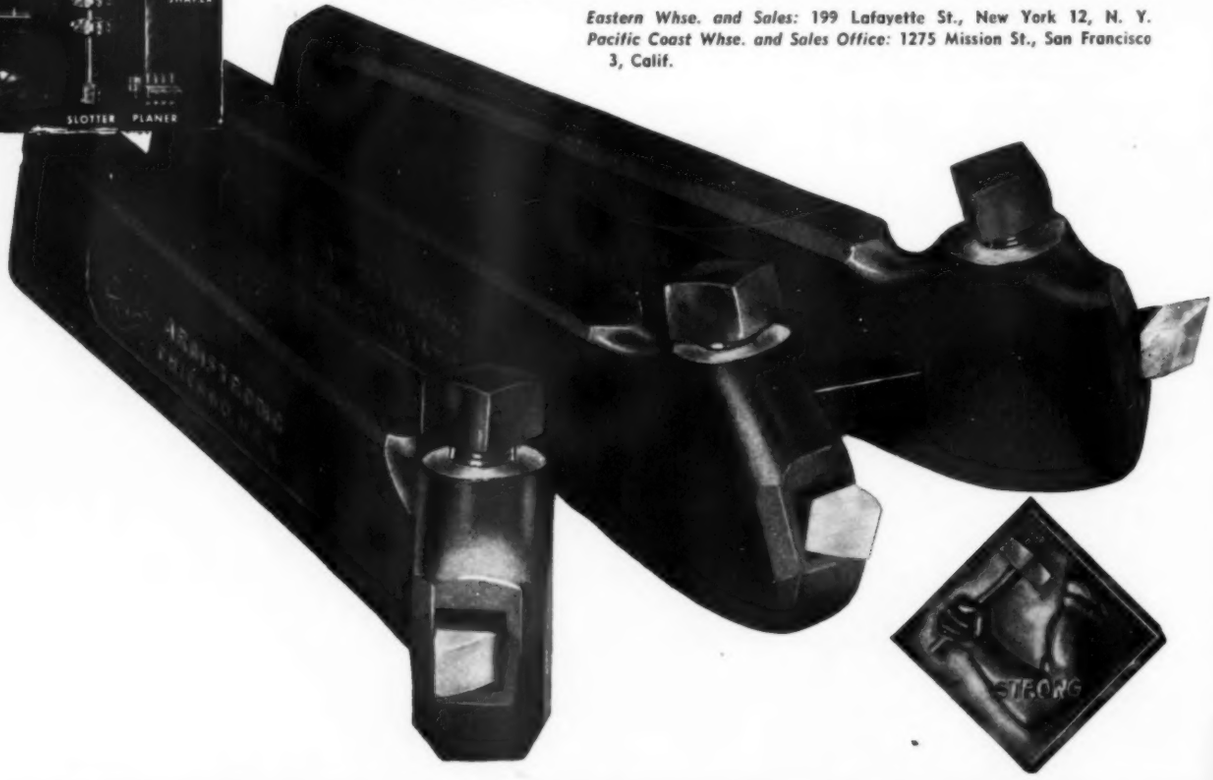
There is no surer way to lower costs and increase output, than to use the correct ARMSTRONG TOOL HOLDER for each operation on all machines.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5215 W. Armstrong Ave. **Chicago 30, U. S. A.**

Eastern Whse. and Sales: 199 Lafayette St., New York 12, N. Y.
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.



In your plant . . . on your products—

USE THESE NEW

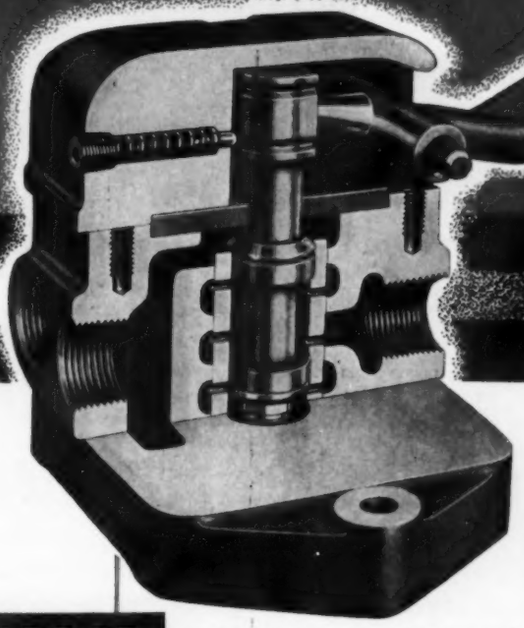
"LOGAN"

AIR CONTROL VALVES

★ NEW, IMPROVED CONSTRUCTION

★ EVERY TYPE OF CONTROL

★ 79 MODELS—COMPLETE SIZE RANGE



This new, complete line of piston-type air valves offers the most convenient, most efficient control for each of your problems. 79 models are now available in a broad range of sizes, for use in your own manufacturing or processing operations . . . for replacement . . . for original installation in the air-operated equipment you market. Here are some of the advantages:

EFFORTLESS CONTROL—Balanced design—valves do not operate against air pressure.

INFREQUENT MAINTENANCE—No rod packing or valve seats to become worn. Self-cleaning.

POSITIVE ACTION—Pistons have long-life synthetic cup packings to prevent leakage.

SIMPLE INSTALLATION—Compact design permits use in limited space and close to other equipment.

EASY TO RECONDITION—No need to disturb air line connections when replacing cup packings. After top or end cover screws are taken out, piston is quickly removed and replaced.

Use these new Logan Air Valves for manual or foot, remote, semi-automatic, automatic, time delayed, interlocking or sequence control systems. Get positive, trouble-free operation in controlling air cylinders and other air-operated equipment. Take advantage of the improved Logan Air Valve design in your plant and on your products. Investigate today.

FREE ENGINEERING SERVICE
Ask Logan engineers for valuable assistance in designing complete air circuits and selecting effective types of equipment. No obligation.

DIRECT OPERATED

MANUAL (2 and 3 position)
Straight or bent handle with spring return to top or bottom, or ball detent. Foot, manifold or flange (recessed) mounting.

FOOT (latching and direct control)

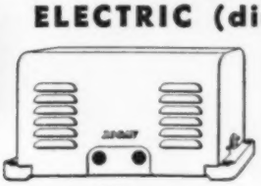
CAM

LIGHT DUTY (¼" ports)

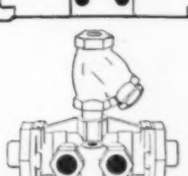
Operated by push button, palm button, toggle, cam or built-in air cylinder.

REMOTE OPERATED

ELECTRIC (direct-acting)



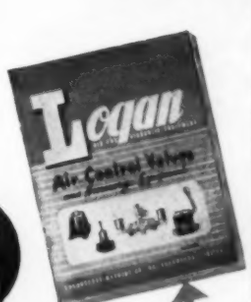
Valve piston operated by lever from solenoid. Controlled by push button or limit switch.



BLEEDER

Controlled by remote 2-way bleeder and 3 or 4-way pilot operating valves, with operation by hand, foot, toggle, cam, electric switch or built-in air cylinder.

PILOT PRESSURE (2 and 3 position)



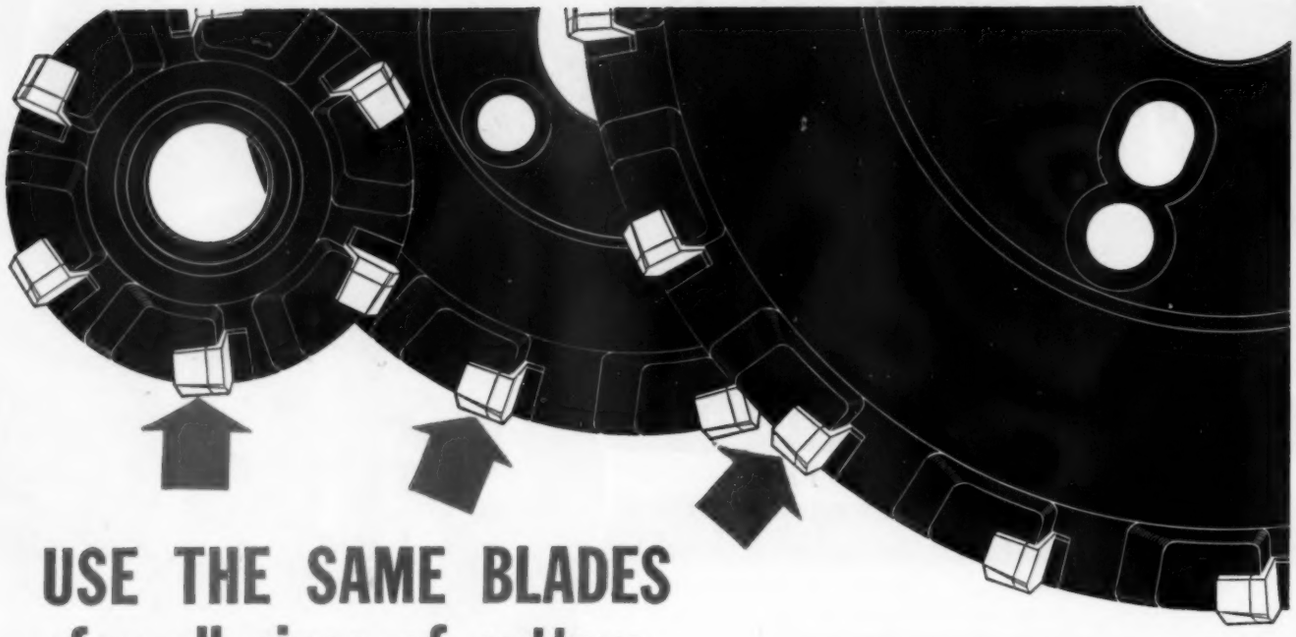
WRITE FOR THIS NEW CATALOG

Logan SAVES ★TIME ★EFFORT ★MOTION

Air and Hydraulic Equipment

LOGANSPORT MACHINE CO., INC.
918 CENTER AVE.
LOGANSPORT
INDIANA

CHUCKS • CYLINDERS • VALVES • PRESSES • SURE-FLOW COOLANT PUMPS



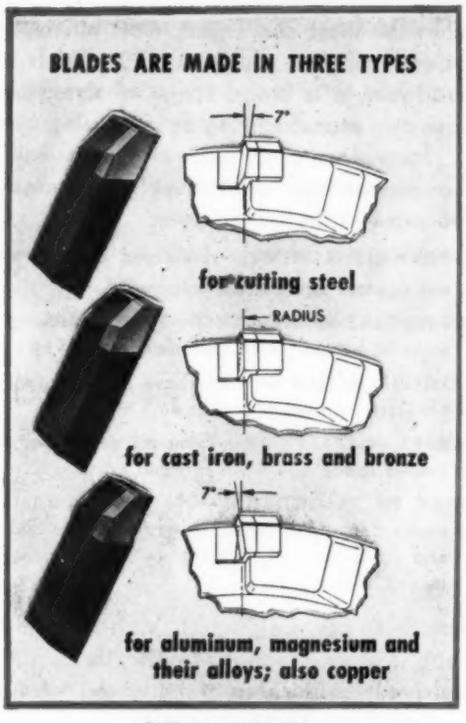
USE THE SAME BLADES for all sizes of cutters

Standardize on E-Con-O-Mill for all your face milling needs and achieve several substantial savings in operating cost.

You cut down your tool inventory by stocking blades (and locks) which fit all cutter bodies, made in standard sizes 5-inch diameter and over.

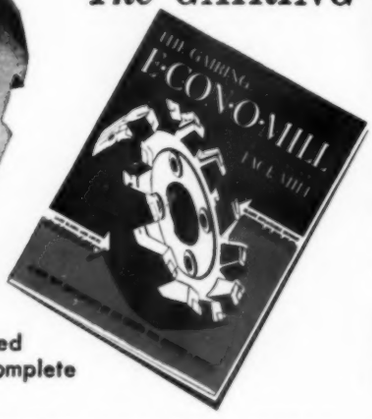
You reduce down-time of your machines by having blades replaced without removing the cutter from the machine. All blades are furnished ready to go to work, and may be re-sharpened individually on a carbide grinder by using a standard checking gage furnished by us. Blades are easily replaced by hand. A standard Allen wrench is the only tool required.

Moreover, these economy features do not interfere with the E-Con-O-Mill being a most efficient tool. Its new design incorporates the latest developments in cutting tool engineering. Its sturdy construction provides truly one-piece rigidity.



PATENT APPLIED FOR

WRITE FOR illustrated folder which gives complete data and prices



The GAIRING

E-CON-O-MILL

A New Carbide Face Mill Made in Standard Sizes 5-inch Diameter and over

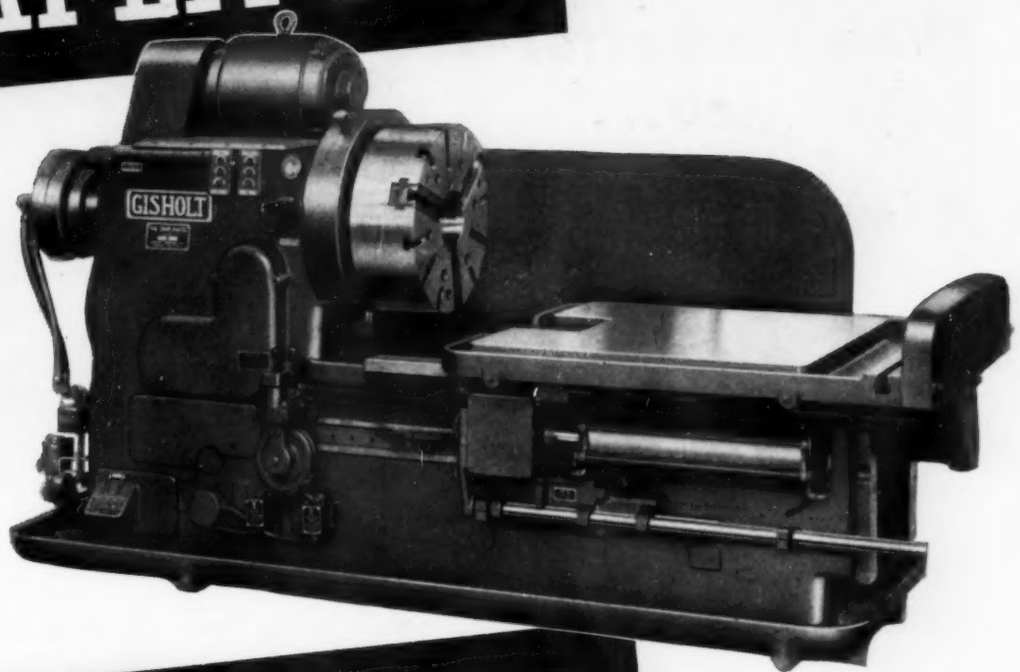
REDUCE DOWN-TIME OF YOUR MACHINES

CUT DOWN YOUR TOOL INVENTORY

The GAIRING TOOL COMPANY, 21226 Hoover Road, Detroit, Michigan

SIMPLIFY

your "special" jobs with the GISHOLT



SIMPLIMATIC

Where you have sufficient volume for automatic machining, you, too, may find the low-cost answer in the Simplimatic.

For here's such adaptability in simple, basic design that it gives you an individualized machine to handle many diverse and unusual problems. Here are some of the reasons:

1. *A wide variety of slide positions is possible on the large platen table for straight and angular feeds.*
2. *Tailstock, hand or pneumatically operated, can be mounted on platen table for between-centers work.*
3. *Linkage arrangement between slides permits spherical boring in conjunction with facing and turning.*
4. *Back facing or back boring through the spindle can often be combined with other cuts in a single operation.*
5. *Vertical head can be used where it provides more favorable working position, with slides cammed individually or entire head cammed as a unit.*
6. *Simultaneous double end machining is possible with full utilization of the base machine.*

Now, with higher costs for labor and materials, investigate the economies the Simplimatic can bring you. Get the facts.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts.*

GISHOLT MACHINE COMPANY

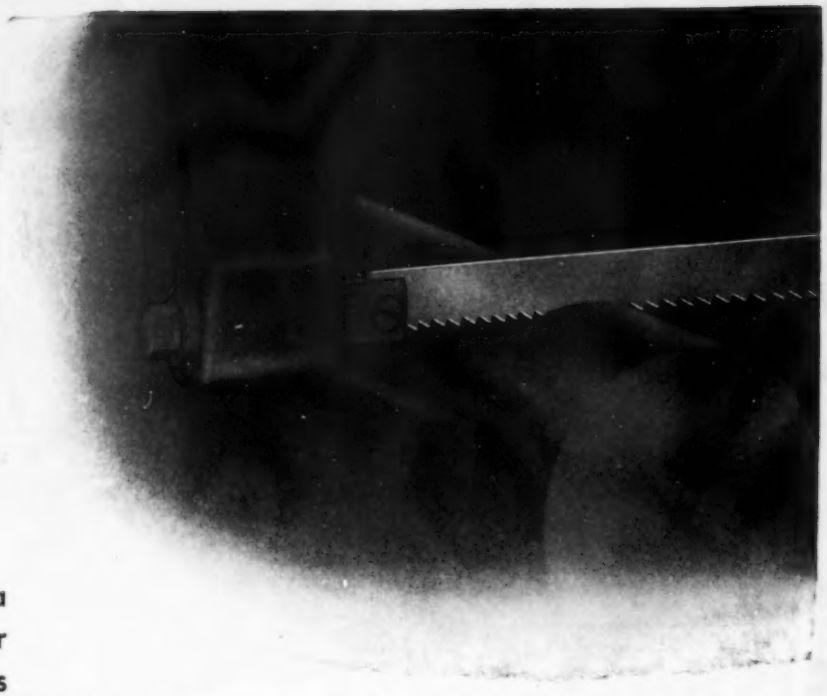
Madison 3 • Wisconsin

TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SUPERFINISHERS • SPECIAL MACHINES

1948

Which is better for you...

A Hack Saw, or a Band Saw?



Only MARVEL can give a strictly impartial answer for only MARVEL manufactures *both* hack sawing machines and metal cutting band sawing machines, and manufactures *both* hack saw blades and metal cutting band saw blades. For this reason, your local MARVEL Sawing Engineer is best qualified to analyze your particular metal-sawing or cutting-off problems and recommend, without bias, the type saw-metal-sawing or cutting-off problems and recommend, without bias, the type sawing machine and correct blade to do your work most efficiently.

MARVEL recommendations are based on actual operational laboratory and field tests covering *cutting-off time and costs* for bars, tubes, and shapes on all types of sawing machines and with various blades. (It is significant that time factors of various so-called "fast" machines vary as much as 4 to 1 on many operations, while costs differ as much as 6 to 1.)

•

Write for new catalog C48, and if you feel that our field service engineer may be helpful to you, let us know.

•

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

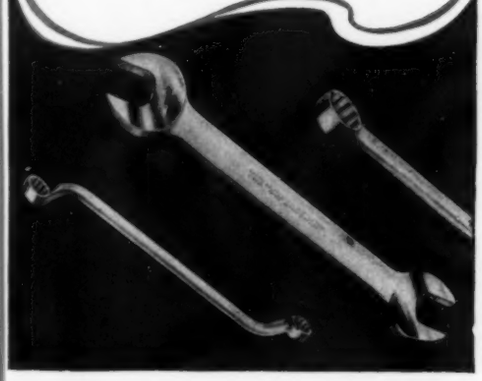
5700 BLOOMINGDALE AVE. · CHICAGO 39, U.S.A.

MARVEL *Metal Cutting* SAWS

Better Machines–Better Blades

● Note that these Engineer's Pattern "Superrenches" are thin enough to operate jam nuts.

YOU GET STREAMLINED STRENGTH WITH WILLIAMS "Superrenches"



Awkward, hard-to-reach adjustments present no problem for these streamlined "Superrenches". Forged from alloy steel, they are light in weight yet their strength is equal to that of the strongest wrenches made. Available in all popular patterns, with openings from 3/16" to 3-1/8". "Superrenches", with highly polished heads, are handsomely finished in durable chrome plate, over nickel.

WILLIAMS

• OUR DISTRIBUTOR IS YOUR LOCAL WAREHOUSE

OPEN END, BOX, ADJUSTABLE & RATCHET WRENCHES; DETACHABLE SOCKETS & SETS; IMPACT SOCKETS, TOOL HOLDERS; LATHE DOGS; "C" CLAMPS; CHAIN PIPE TONGS & VISES; FLANGE JACKS; PLIERS; SCREWDRIVERS; PUNCHES & CHISELS; SOFT FACED "NUPLAFLEX" TIPPED HAMMERS; HOIST HOOKS; EYE BOLTS; ROD ENDS; CRANK & BALANCE HANDLES; THUMB SCREWS & NUTS.

J. H. WILLIAMS & CO., BUFFALO 7, N. Y. *Distributors Everywhere*

For Accuracy, High Finish and Great Precision, Use These Tested Sterling Wheels

●These Sterling Cylindrical Grinding Wheels produce unsurpassed accuracy and smoothness of the ground surfaces. They readily shape and reduce to required size hard materials that cannot be machined . . . and do it to limits of 0.0001-inch, and better!

Available in any desired grain size and special Sterling bonds, these wheels provide unusual economy and lasting performance. A Sterling engineer will gladly arrange a test in your grinding department, under such conditions as you may specify . . . write us today!

"THE WHEELS OF INDUSTRY"

Sterling

● May we send you the Sterling folder on Cyclindrical Grinding specifications? Free for the asking.

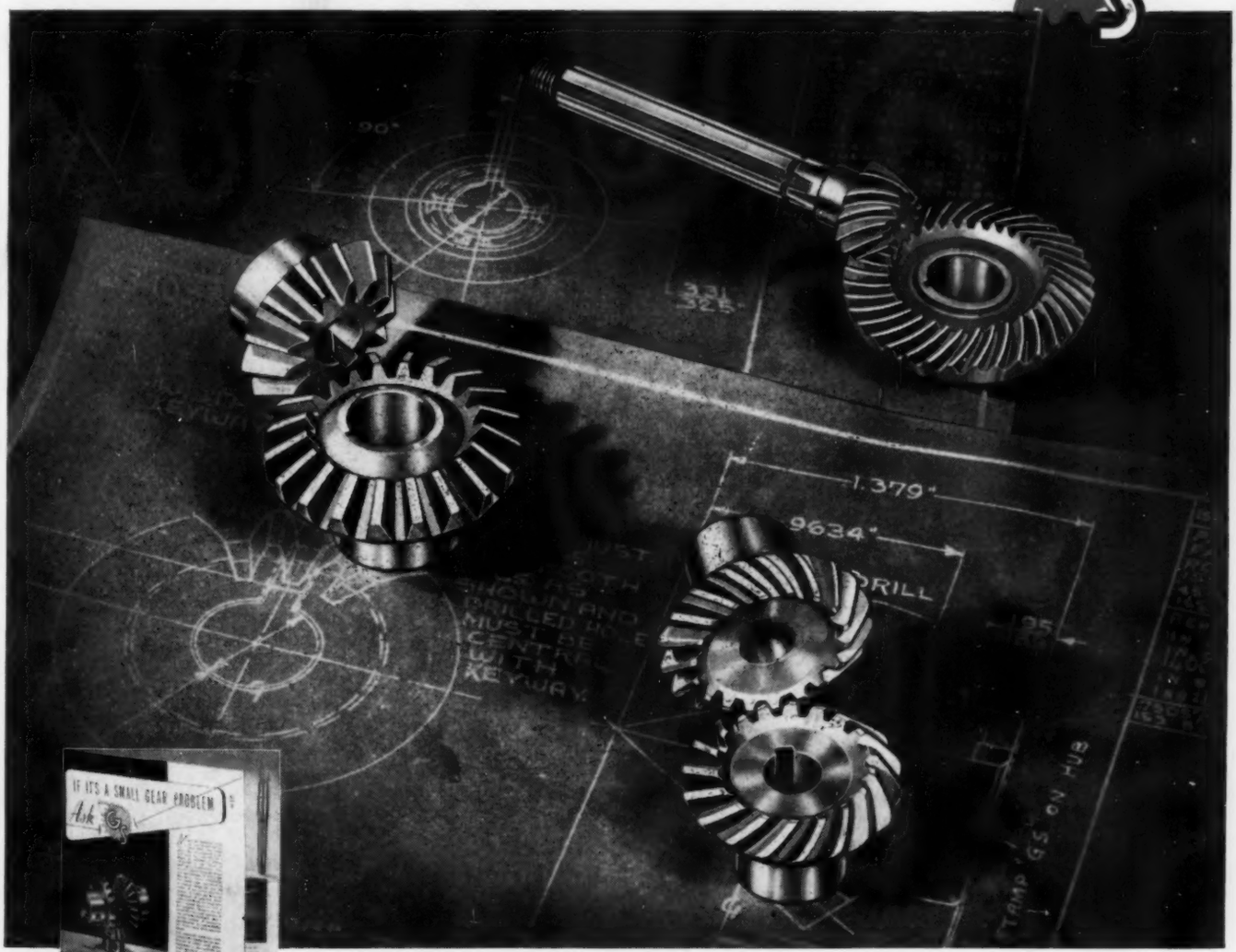
· STERLING ABRASIVES ·

THE STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY

YOU CAN *DEPEND ON* GEARS BY

FRACTIONAL HORSEPOWER GEARING



You can get this valuable G. S. Small Gear Bulletin free, by simply asking for it on company stationery. Send for a copy now, and discuss your needs with our skilled engineers.

DEPENDABILITY is an important asset in the Small Gears you buy. It means that your product will give greater satisfaction . . run *smoother* and *quieter* . . over a longer period of time. G.S. Small Gear Craftsmen *take pride* in the superior excellence . . *the greater uniformity* of their products. During 30 years of specialization they have reduced the quantity production of Fractional Horsepower Gears to an exact science. Rigid and repeated inspections with every modern precision-measuring device has cut imperfections to the vanishing point. You can place *implicit confidence* in G.S. Small Gears . . and in the kind of friendly, cooperative service we give.

GEAR Specialties

Spurs · Spirals · Helicals · Bevels · Internals · Worm Gearing · Racks · Thread Grinding

2635 WEST MEDILL AVENUE · CHICAGO 47, ILLINOIS

MEMBER OF AGMA

WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS

The CONE AUTOMATIC MACHINE COMPANY

sees many

GOOD THINGS AHEAD

It is reported that . . . . . .

An optical comparator, developed by Westinghouse, compares the grain sizes of metal samples on a glass screen.

get ready with CONE for tomorrow

Westinghouse Lamp Div. is drawing tungsten wire as fine as .0018" a pound of which is 950 miles long.

be ready with CONE for today

The Hypermatic, a high-speed punch press made by Lempco Products, Inc. of Bedford, Ohio, is claimed to be vibrationless, even at top speed.

get ready with CONE for tomorrow

Union Pacific RR is experimenting with the adaptation of a 10,000 h.p. aircraft gas turbine to locomotive use.

be ready with CONE for today

Minneapolis-Honeywell Regulator Co. has an electronic compass for aircraft that has no moving parts and can be used as a magnetometer in prospecting.

get ready with CONE for tomorrow

In the attempt to push air speeds into the transonic range, Curtiss-Wright Corp. has developed a propeller with crescent-shaped, "swept-back" blades.

be ready with CONE for today

Brighter, cleaner and more durable shades of brown for enamels, paints, inks, plastics, etc. are forecast in duPont's announcement of its new pigment "Auric Brown."

get ready with CONE for tomorrow

The Type WAA Race Tester offered by Physicists Research Co. provides for both micro-inch measurement of surface waviness of inner and outer bearing races and control of production set-ups.

Pharis Tire & Rubber Co. claims that its two-ply, glass fabric tire is stronger than four-ply rayon.

be ready with CONE for today

The new Crosley is said to be the first postwar car with an aluminum body.

get ready with CONE for tomorrow

American Welding and Mfg. Co., Warren, Ohio, is ready to road-test its application of torsional springing to railroad car trucks.

be ready with CONE for today

Lundberg-Ryan Air Explorations have ordered two Bell helicopters specially equipped for oil and ore exploration.

The National Electrical Manufacturers' Association is engaged in the standardization of small electric motors, such as those used in household equipment.

get ready with CONE for tomorrow

General Electric Co. has designed pallets of corrugated board which save shipping weight and can be thrown away after one use.

be ready with CONE for today

The top of an 85-foot, million-gallon tank at the U. S. Air Force Olmstead Airbase is being formed by spraying concrete over wire mesh.

get ready with CONE for tomorrow

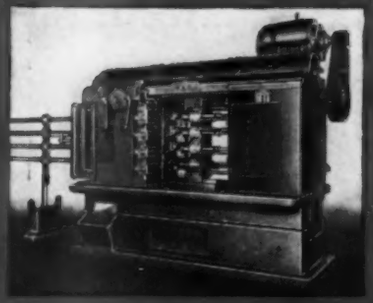
Volumetric measurement of corrosive liquids to an accurate approaching laboratory precision is made possible by a new meter made by Browser Inc. of Fort Wayne.

FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

NOW

In the Multi-Single 4-Spindle Conomatic, you have one machine that will produce in volume, accurately and with quality finish, the production of 4 single spindle machines—in *the floor space of one.*

The 4 connecting links illustrated are produced from .457" S.A.E. 1113 in a cycle of 6 seconds, which effects a time of 1½ seconds each.



Ask your CONE representative to show you our new color-motion picture

CONE

AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.

reduces machining costs on automotive cylinder blocks

This Baush Vertical W-6 Hydraulic Multi-Spindle Machine Tool—shown in action at plant of a large heavy-duty engine manufacturer—is just one of many types of single-purpose, multi-operation machines designed and built by Baush to reduce production machining costs.

Baush ingenuity and "know-how" in machine tool design has enabled many outstanding engine makers to meet the challenge of today's demands for lower production costs. Send us your problems. With over 50 years of experience in this field we know we can help to lower your machining costs.

Part — Automotive Cylinder Block
Operations — Removing excess stock from main bearing ribs, essential for hone clearance, and chamfering the bottom of cylinder bores.

specifications:

Baush Vertical W-6 Hydraulic Multi-Spindle Machine. Cast-iron bed, column and head saddle. Hydraulic pump and cylinder — 18″ maximum stroke.
Fixed center head furnished with (6) heavy-duty stub nose spindles.
Head furnished with special device for positioning of spindles.
Spindles driven by 10 H.P. main motor and hydraulic pump powered by 2 H.P. motor.

fixture:

Part loaded into stationary fixture resting on top surface. Cylinder block is slid off conveyor onto loading rails and pushed by hand into fixture to a temporary position. Six lower pilot bushings are raised into cylinder bores. The two end pilot bushing stools locate in cylinder bores. The other four have clearance. Block is clamped by a planer type clamp on each end.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

"KNOW YOUR FILES and CUT COSTS"

The use of the right file saves materials, the workmen's time, and improves results. Keep these advertisements (this is first of a series) . . . they will help you select "The right file for the job."

Subject: FILES FOR BRASS

...ed by Nicholson File Co.

BRASS FILE

FLAT BASTARD FILE

FILING BRASS

WHY BRASS REQUIRES A SPECIAL FILE Filing brass is far different from filing steel. Although brass is the softer metal, it is more malleable than steel, and also very ductile and tough. Brasses differ in composition and in their characteristics; and where regular-purpose files do not meet all requirements, files having extra sharpness or special tooth construction are required for the very best results.

THE DIFFERENCE BETWEEN SPECIAL BRASS AND REGULAR FILES Nicholson's study of the problems involved has produced a combination of tooth angles and a number of tooth points per inch that give excellent results. Compare a Nicholson or Black Diamond Brass File to a regular Flat Bastard File, and you will see that the Brass File has a long overcut angle and a short upcut angle. The short upcut angle prevents the file from running off the work, while the long overcut, producing many *tooth points* on the short upcut, *of the proper shape* to break up the filings, allows the file to clear itself of chips. In less technical language, this combination of angles and teeth prevents the file from taking too big a bite out of the soft metal and minimizes clogging and chattering.

CORRECT USE OF BRASS FILE Correct use of the Brass File requires the filer to use a little more pressure on the heel of the file than on the point. This, as well as the arrangement of the angles, helps keep the file from biting too deeply; and a slight motion to the right and left on alternate push strokes contributes to better filing and smooth finish. Nicholson and Black Diamond Brass Files come in Flat and Half Round shapes, and in 8", 10" and 12" lengths. Available through your industrial distributor.

Nicholson makes special-purpose files for Brass, Lead, Aluminum, Stainless Steel, Foundry Castings, Die Castings, Die Making, Lathe Filing, Curved and Shear Tooth Filing—and Swiss Pattern Files of all shapes and sizes. FREE BOOK—*"FILE FILOSOPHY."*

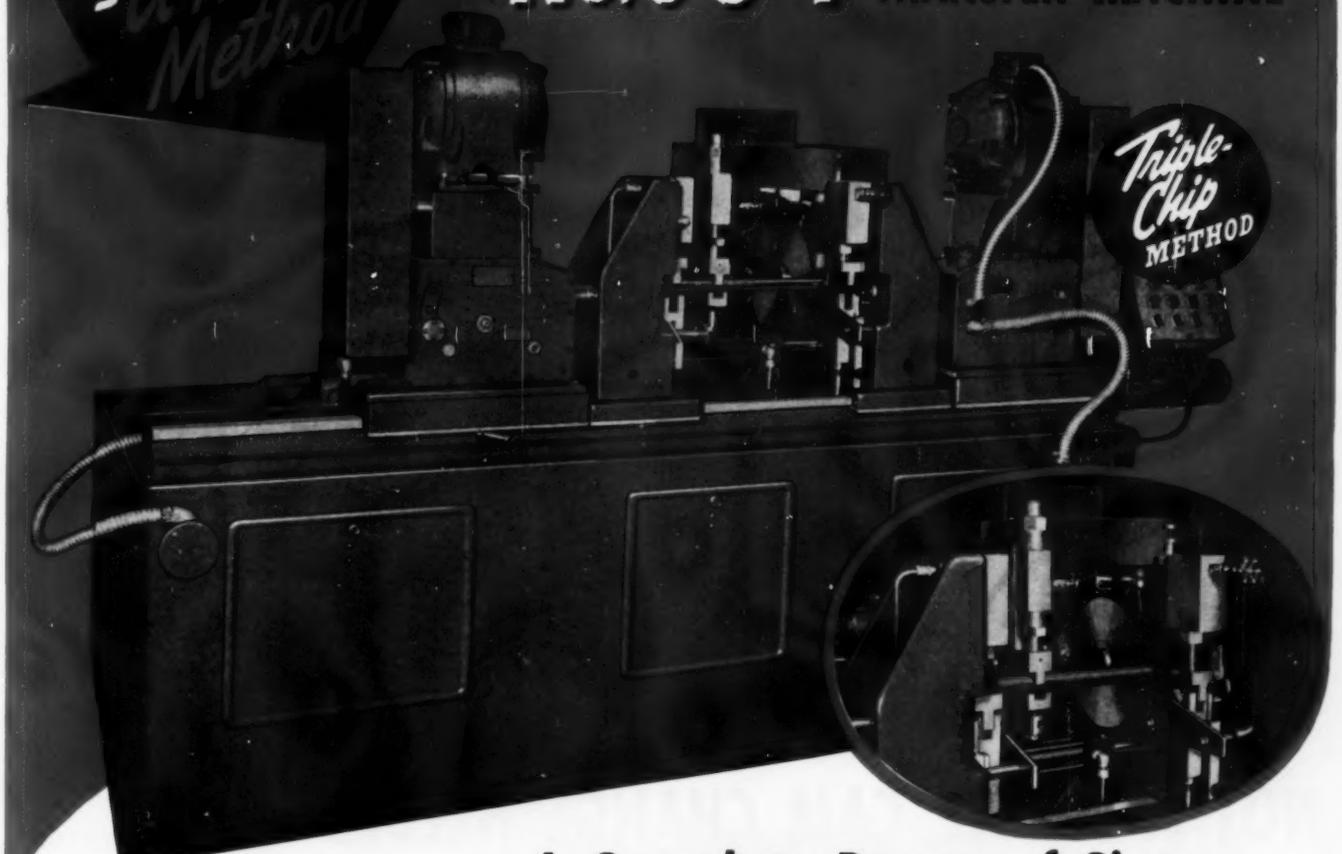
NICHOLSON FILE CO., 29 Acorn St., Providence 1, Rhode Island

(In Canada, Port Hope, Ont.)

NICHOLSON FILES FOR EVERY PURPOSE

NOT JUST A NEW MACHINE - A New Method

The Motch & Merryweather No. 00-T Automatic TRANSFER MACHINE



A Complete Range of Sizes is Now Available

The No. 00-T cuts automatically to length. Transfers to second station. Machines both ends (threads, center drills, reams, faces, chamfers). Ejects automatically."

A new method, definitely. There are no other machines like the No. 00-T M. & M. Transfer Circular Sawing Machine. It "operates on" both ends of solid bars or tubing *simultaneously.* It cuts stock *to square, accurate milled lengths* by the Triple-Chip Method and transfers it to a second station to be machined on both ends while the next piece is being sawed. Both inside and outside diameters, for example, can be chamfered. Operation is automatic from start to finish. Eliminate costly second operations! Get the details *now.*

Ask for our well illustrated Bulletin "A-100".

Only M & M builds ALL 3: CIRCULAR SAW · SAW BLADE · BLADE GRINDER

THE MOTCH & MERRYWEATHER MACHINERY CO.
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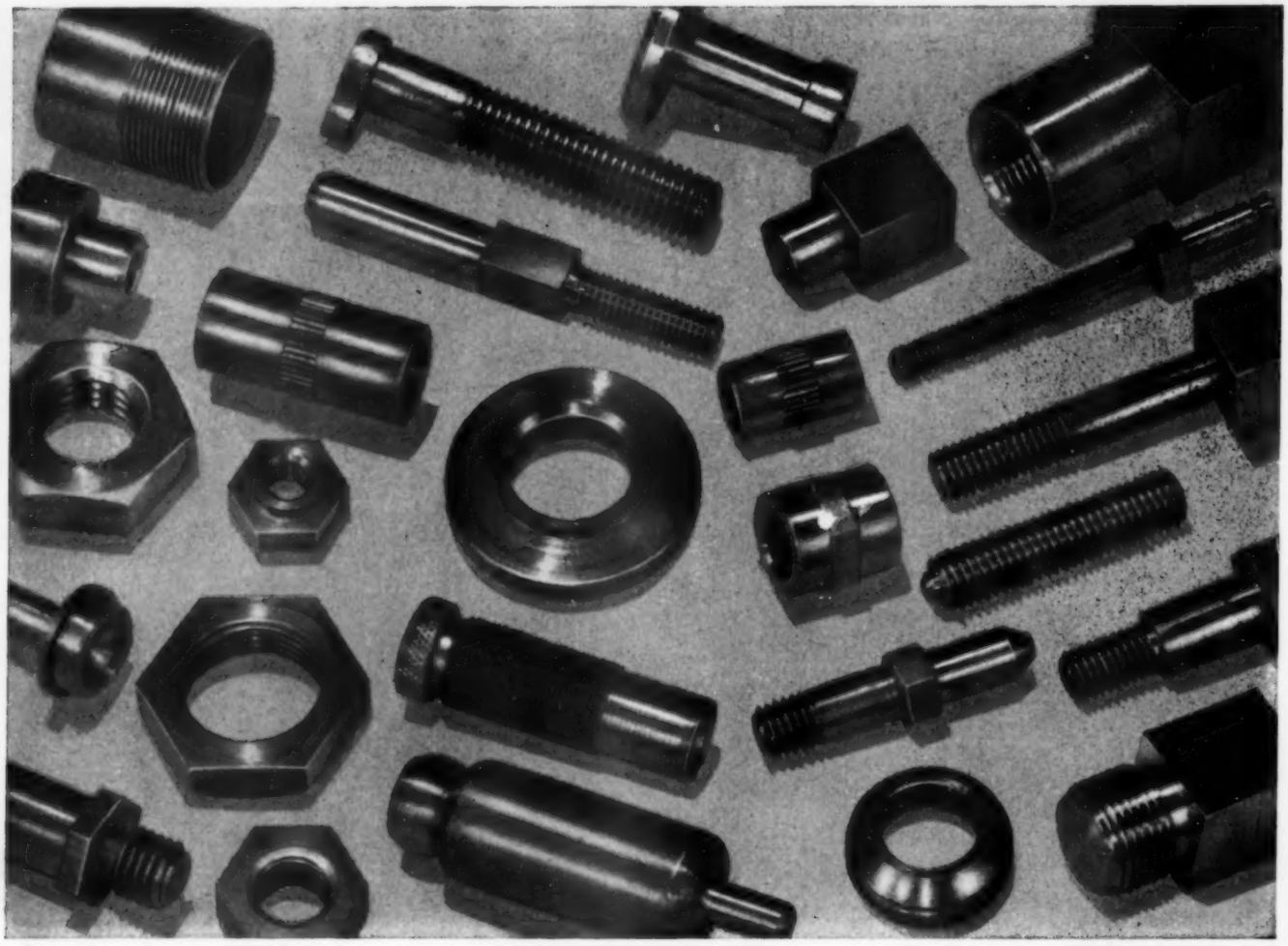
AT YOUR COMMAND • AN UNPARALLELED EXPERIENCE IN CIRCULAR SAWING



NOT A SINGLE CAM CHANGE NEEDED

To Make All of These Parts

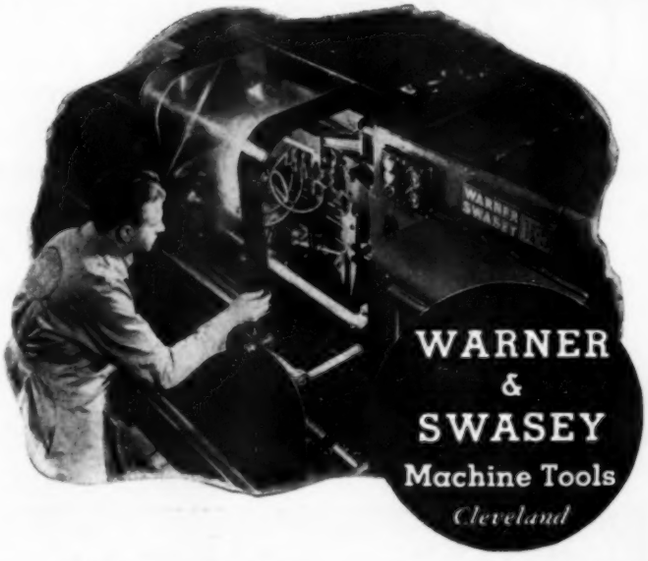
ON A WARNER & SWASEY 5-SPINDLE AUTOMATIC

★ Nearly 300 different parts are produced on a Warner & Swasey 5-Spindle Automatic at Electric Controller & Mfg. Co., Cleveland.

★ *Not a single cam change* is required to produce this variety of jobs.

★ Patented "Quick Set" mechanism eliminates all expense of designing, machining, storing and finding cams, and time-taking setup.

Call your Warner & Swasey field representative.

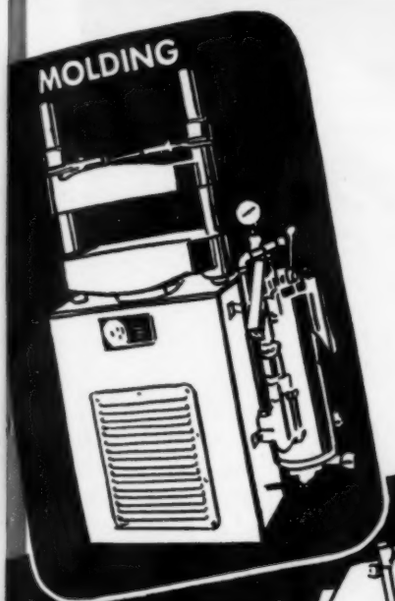


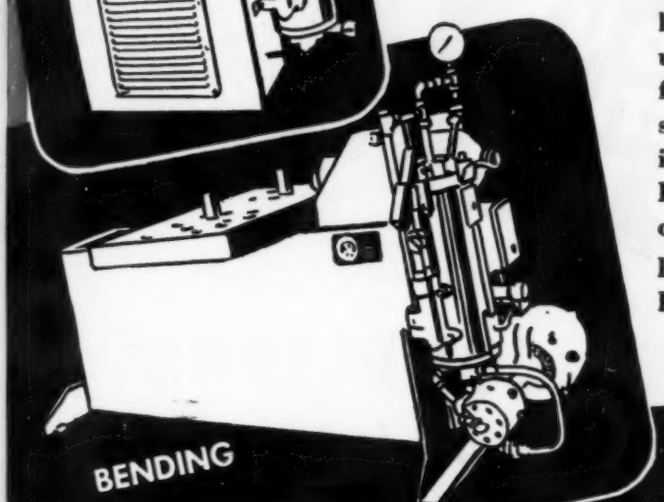
You can machine it better, faster, for less... with a Warner & Swasey

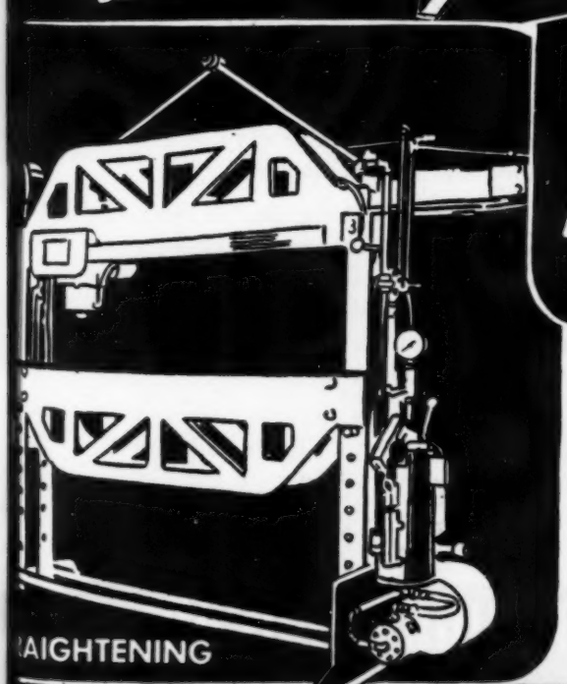
TURRET LATHES, MULTIPLE AND SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

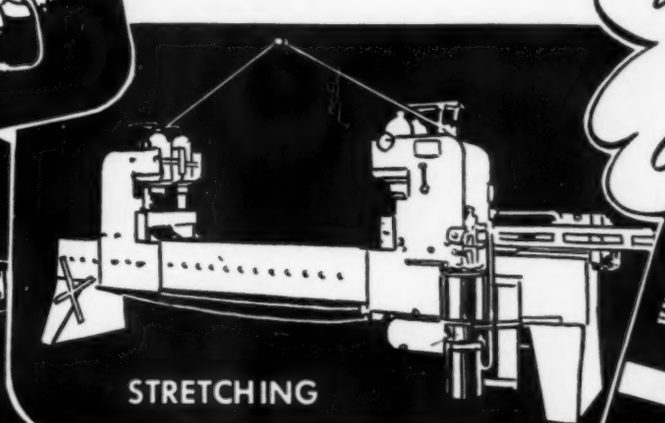
Name the JOB!

There's a KRW PRESS that can do it BETTER... for LESS









● **Illustrated here are four KRW Hydraulic Press adaptations that are typical of many being built by KRW today. All are priced from 30 to 200% less than competitive makes of comparable tonnages or capacities. All are motor-driven and incorporate the time and production proven features that have made the standard KRW Hydraulic Arbor Presses...** ***the most widely used press of their type in America.*** **Take the KRW Sliding Head Straightening Press as an example. This type KRW Press has been effecting tremendous labor savings in fabricating plants where plate must be "trued up" before it is processed or fabricated. The heavy, hand method formerly used was archaic and very costly by comparison. The same story holds true of KRW Stretcher-Levellers, KRW Blanking and Forming Presses, KRW Compression Molding Presses, KRW Bending Presses and many others. To save your time and ours, tell us your problem in terms of what you want to accomplish. We'll give you an answer and furnish literature that is pertinent to your needs. Mail the coupon now.**

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Bending Presses ☐ Compression Molding Press ☐

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215 MAIN ST. · BUFFALO 3, N. Y.

"Push-Tite"—with Valve in Socket

Series 8000—with Valves in Socket and Plug

HANSEN COUPLINGS

Quick disconnect with instant seal

Minutes saved by the use of Hansen quick-connective couplings add up to substantial savings in time, labor and costs. Operations repeated over and over can be simplified and speeded up with Hansen couplings—couplings that connect or release at a touch of the thumb. The plug pops out when released by movement of the socket sleeve. Line seal is instantaneous.

Merely push the plug into the socket, and the line is open to flow—a slight movement of the sleeve unlocks and releases the plug and flow is instantly shut off. Series 8000 has seals in both plug and socket, and is recommended for hydraulic service. The "Push-Tite" coupling seals in the socket only and is generally used in air, oil, and grease line connections.

Any plant using air, oil or hydraulic service can save time and reduce costs by the use of Hansen couplings. Simple and easy to operate—compact and sturdily built. Write for catalog.

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Southern Ohio, West Va., Ky.: Steinhagen Airline Products, Dayton, Ohio
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Southwest Territory . . . . C. C. Brownfield, Dallas, Texas
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Idaho, Oregon, Washington: Jack J. Kolberg, Seattle, Wash.
Central Western States . . . . John Henry Foster Company, St. Louis, Mo., Minneapolis, Minn.
Northern Cal., Nevada . . H. E. Linney Co., Oakland, Cal.
Michigan . . William H. Nash Company, Detroit, Michigan
Indiana, Wisconsin: Neff Engineering Co., Ft. Wayne, Ind.
Northern Illinois, Eastern Iowa: Walter Norris Engineering Company, Chicago, Illinois
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QUICK CONNECTIVE FLUID LINE COUPLINGS . . .

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

New "double-jointed" drilling & tapping machine gets spindle precision with Timken® bearings

THE head of this Kaukauna drilling and tapping machine can be swiveled 360 degrees, vertically or horizontally. To assure precision drilling and tapping, the spindle is mounted on Timken bearings.

Timken tapered roller bearings hold spindles rigid—keep them revolving accurately under the heaviest loads. Their tapered construction carries radial and thrust loads without deflection or end-movement and permits accurate preloading to any desired degree. Re-adjustment on the job is unnecessary due to "Generated Unit Assembly".

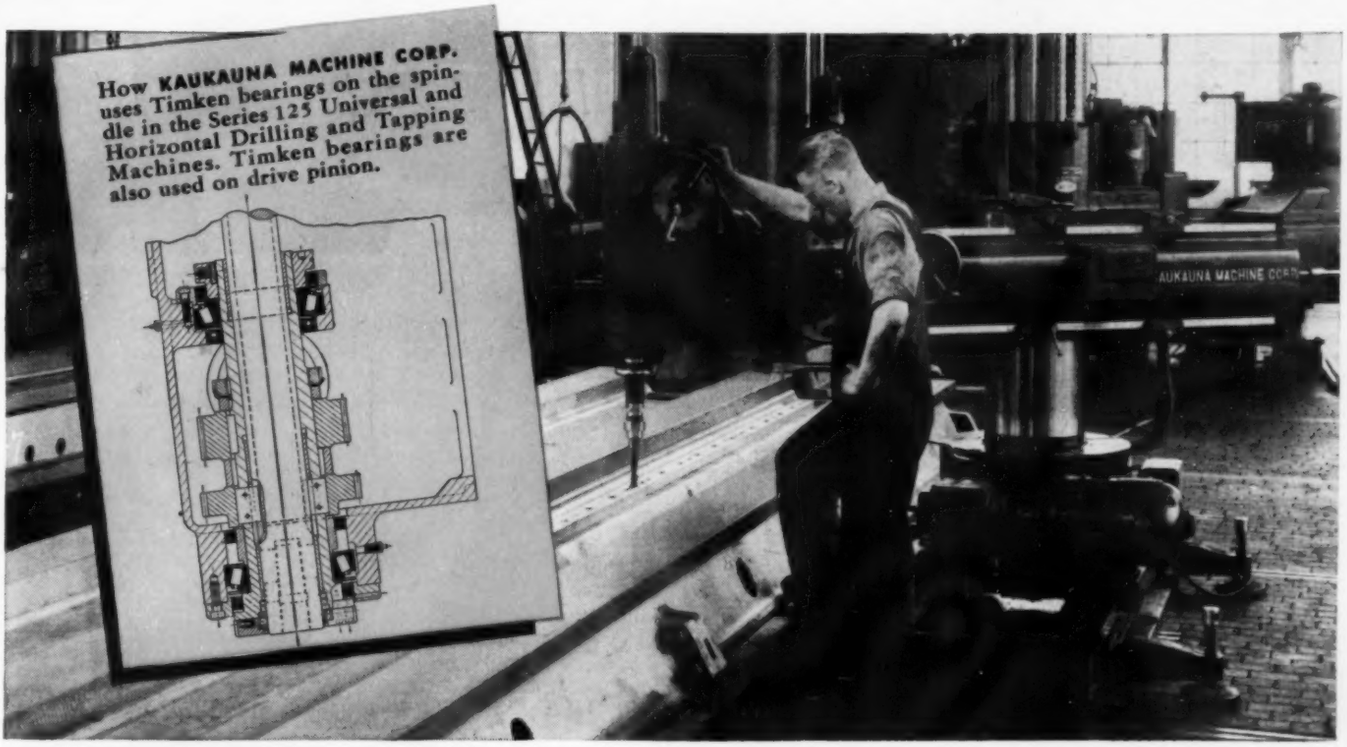
The rolls and races of Timken bearings are made of Timken fine alloy steel for toughness—then case-hardened to give you a wear-resisting surface. The line contact between rolls and races provides maximum load-carrying capacity.

Because Timken bearings are manufactured to extreme precision and finished to almost incredible smoothness, friction is eliminated.

Remember, no other bearing can bring you *all* the advantages you get with Timken tapered roller bearings. Be sure you have them in the machine tools you build or buy. Look for the trade-mark "Timken" on the bearing. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.


How KAUKAUNA MACHINE CORP. uses Timken bearings on the spindle in the Series 125 Universal and Horizontal Drilling and Tapping Machines. Timken bearings are also used on drive pinion.
KAUKAUNA MACHINE CORP.

FINISHED TO CLOSER TOLERANCES

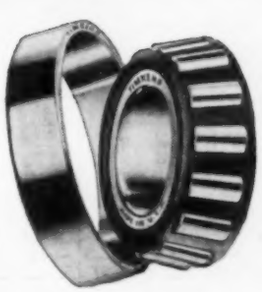
Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at Timken.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

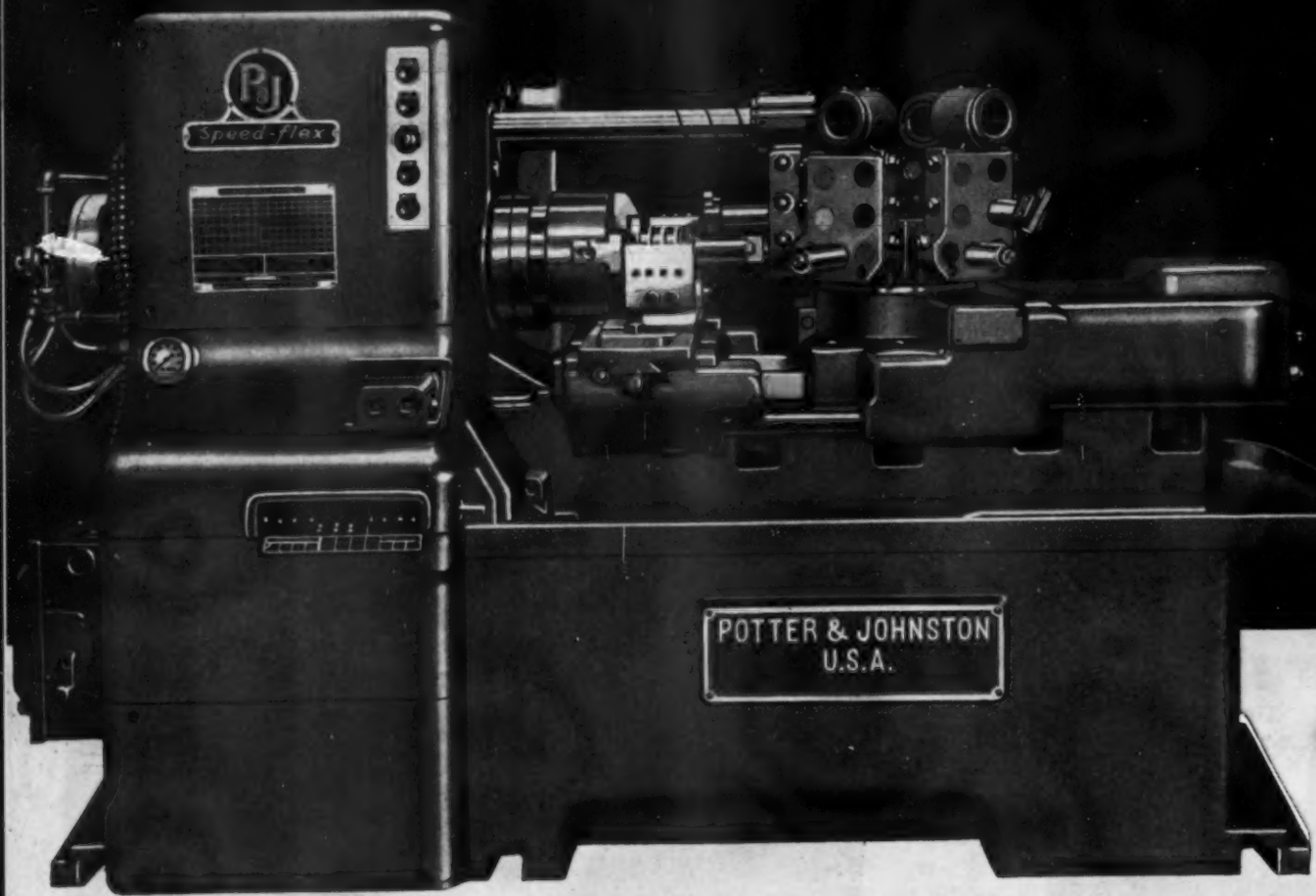
TIMKEN

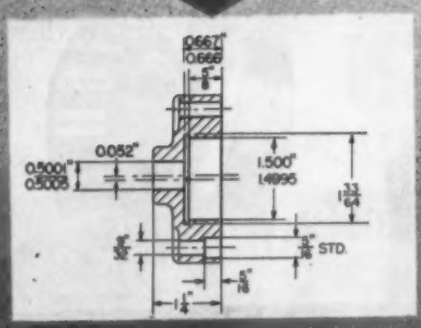
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

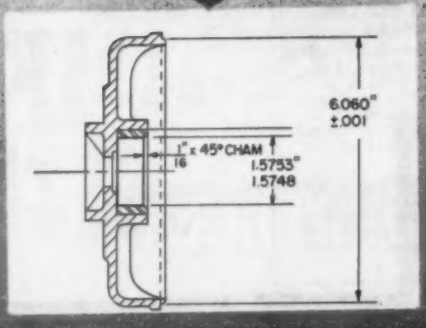


NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →✳←

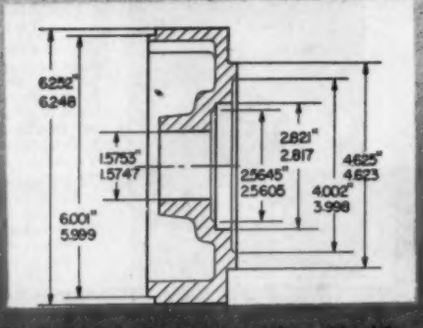




(1) All four holes in this aluminum oil-seal cover are drilled with one drill head. The center hole and the small hole are reamed and bottom hole (A) counterbored with a second drill head. Note the concentricity of the center hole relative to the 1.500" counterbore.



(2) The electric motor end bell represented in this sketch is an aluminum die-casting with a steel insert. This frail casting presented a vibration problem. Tungsten-carbide tools are used in machining the part, with a production rate of 42.5 parts per hour at 85% machine efficiency.



(3) Launch of aluminum mounting end plate. Only boring-bars and turning and facing tools are required for this job, so drilling or reaming operations being necessary. The production rate is 37.3 pieces in 51 minute hour.

PROFITABLE OPERATIONS ON SMALL PARTS
. . . ONE OF THE PRINCIPAL ADVANTAGES OF

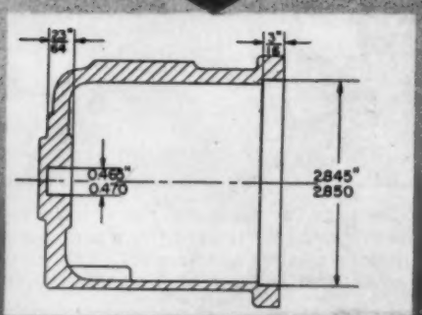
Potter & Johnston's new

3-U SPEED-FLEX

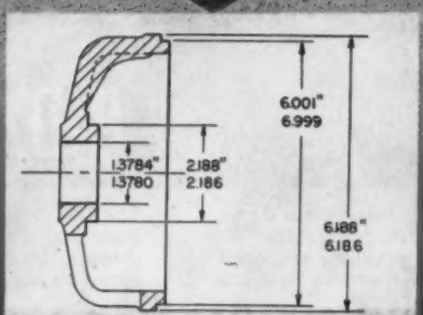
automatic turret lathe

Here is a small high-speed automatic lathe that does boring, turning and facing operations on small parts in a single setup. It can perform these operations on castings and forgings up to 6" dia., saving an impressive amount of time, particularly since work of this size used to be handled on slower, larger automatics. The higher spindle speeds, flexibility of set-up and ease of controls on the 3-U are the factors that make operations on small parts profitable. The drawings across the bottom of these pages suggest the great flexibility of the 3-U. The parts are (1) a cast aluminum oil-seal cover, (2) a die-cast aluminum motor end bell, (3) a cast aluminum mounting end plate, (4) a die-cast aluminum governor body, (5) a cast iron motor end shield, and (6) a cast iron gear blank. Various requirements were: an exceptionally good finish, close tolerances, rough finishing and solutions to vibration problems. Captions under each drawing highlight the methods used in each instance. As a study of these examples will show, the new turret lathe designed by P. & J. permits fast, automatic machining of many types of small parts that formerly were finished in several machines. It permits faster, more economical machining of both ferrous and nonferrous castings and forgings up to 6" dia. Let us show you how this machine can be used on *your* work. We'll be glad to make tooling suggestions and actual time studies.

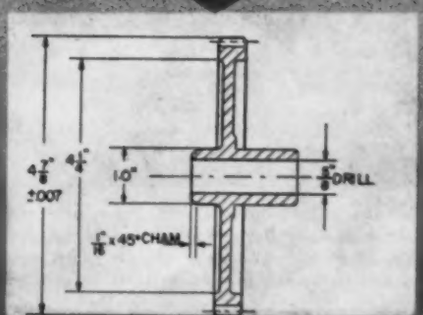
POTTER & JOHNSTON MACHINE CO., PAWTUCKET R. I.



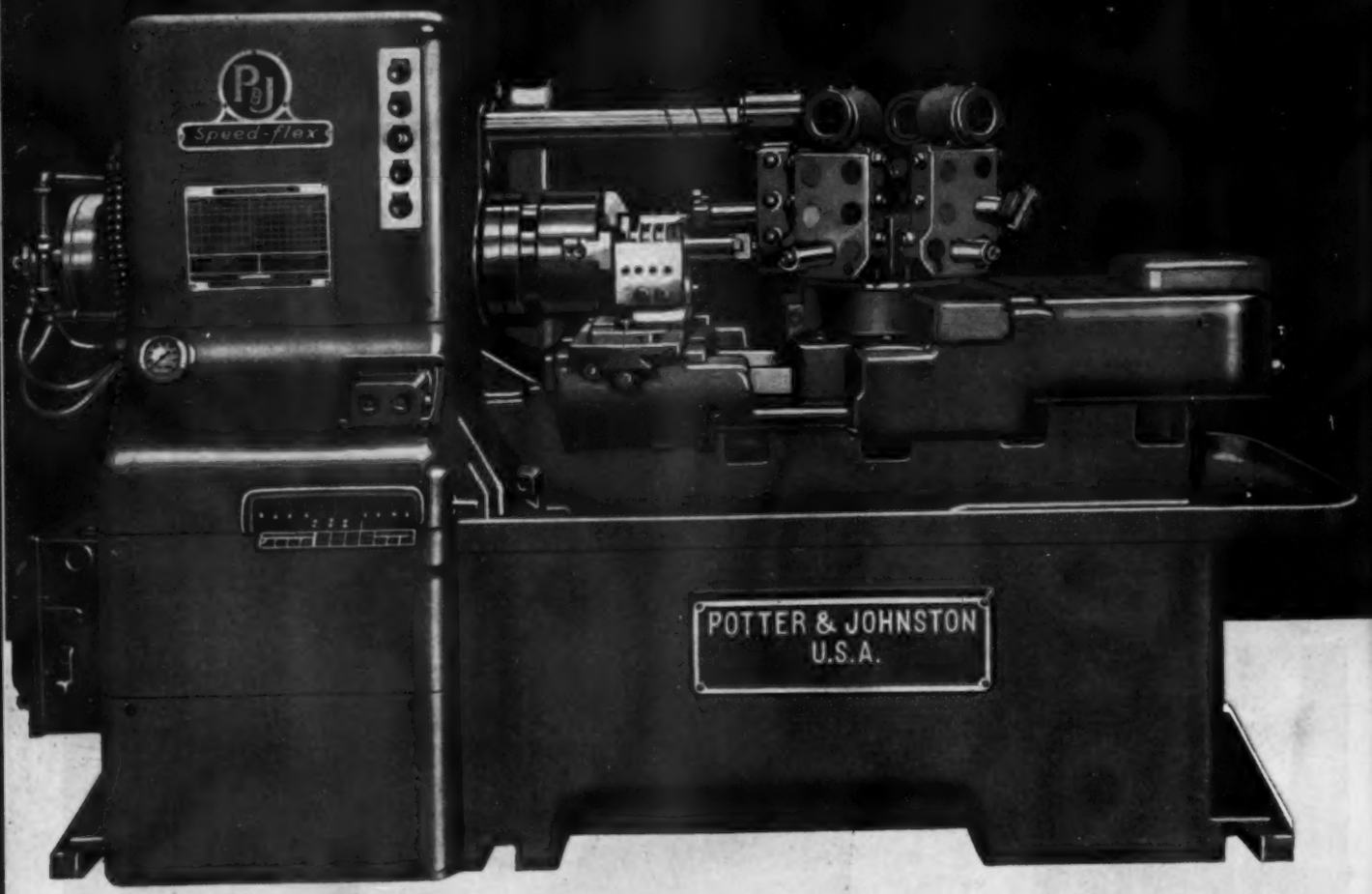
(4) A production of 87 parts per hour is obtained on the 3-U SPEED-FLEX when machining the die-cast aluminum governor body shown here. Because of the different diameters being turned, the cutting speed differs, being 950, 120, 540 and 120 feet per minute for the 1st, 2nd, 3rd and 4th c.f.'s.

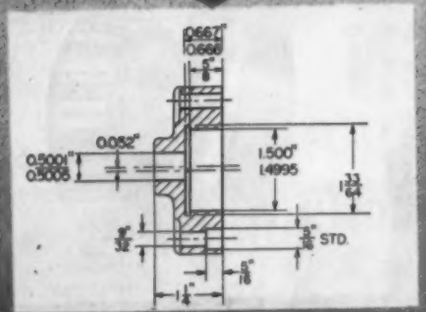


(5) Approximately 240 of these cast iron motor end shields are produced per hour at a machine efficiency of 83%. Rates of production are naturally lower on cast iron. This shield presents no vibration problem, since its design, along with its cast iron construction, almost totally eliminates vibration.

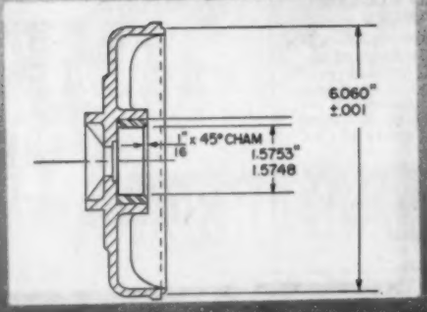


(6) This cast iron gear blank is turned, faced and drilled in approximately 2 1/3 minutes. The production rate, on an automatic turret lathe, permits one operator to handle three machines. Tungsten-carbide tooling is used on all turret faces, giving positive sizing and fine finish.

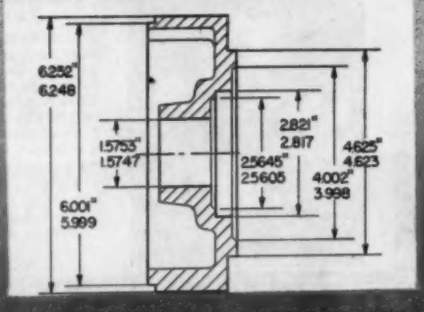




(1) All four holes in this aluminum oil-seal cover are drilled with one drill head. The center hole and the small hole are reamed and bottom hole (A) counterbored with a second drill head. Note the eccentricity of the center hole relative to the 1.500" counterbore.



(2) The electric motor end bell represented in this sketch is an aluminum die-casting with a steel insert. This frail casting presented a vibration problem. Tungsten-carbide tools are used in machining the part, with a production rate of 42.5 parts per hour at 85% machine efficiency.



(3) Sketch of aluminum mounting end plate. Only boring-bars and turning and facing tools are required for this job, no drilling or reaming operations being necessary. The production rate is 37.5 pieces in 51 minute hour.

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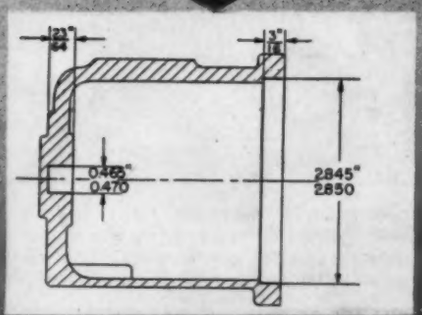
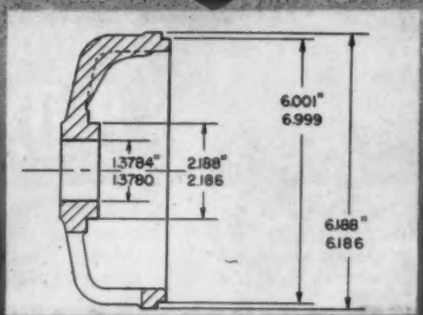
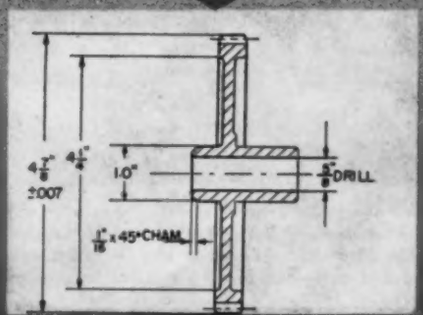


(4) A requirement of 60 parts an hour is obtained on the 3-U SPEED-FLEX when machining the die-cast aluminum governor body shown here. Because of the different diameters being turned, the cutting speed differs, being 950, 120, 540 and 720 feet per minute for the 1st, 2nd, 3rd and 4th t.f.'s.

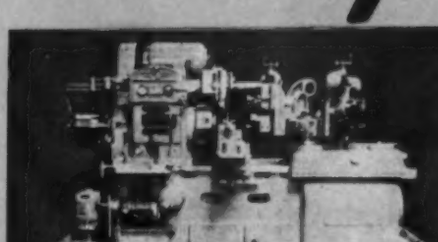


(5) Approximately 34.8 of these cast iron motor end shields are produced per hour at a machine efficiency of 85%. Rates of production are naturally lower on cast iron. This shield presents no vibration problem, since its design, along with its cast iron construction, almost totally eliminates vibration.



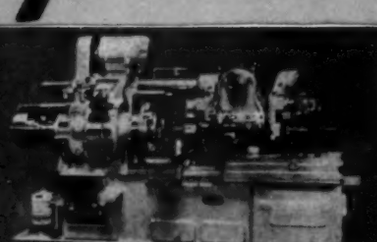
(6) This cast iron gear blank is turned, faced and drilled in approximately 2 1/3 minutes. The production rate, as an automatic turret lathe, permits one operator to handle three machines. Tungsten-carbide facing is used on all turret faces, giving positive cutting and finer finish.

For big and heavy work



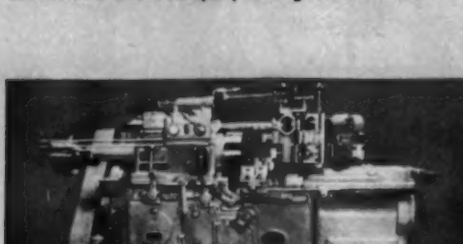
5-D H.S.

5-D-2-15



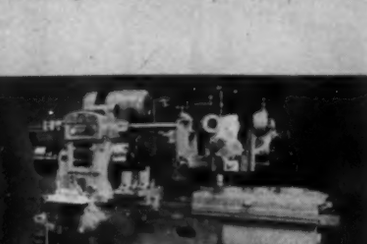
5-D H.S. Type 5-D H.S. Power Flex has four automatic changes of spindle speed while under cut; three selective automatic changes of feed; automatic binding of turret following index, and 20 changes of speed between 33 and 610 rpm., arranged in five sets of four automatic changes.

5-D-2-15. This Power Flex is a two-spindle automatic turret lathe signed to meet production requirements where manufacturing operati call for an output in excess of that to be secured from a single spi unit. This 15" model has 28 changes of speed between 16 and 525 r Also built in 9" and 12".



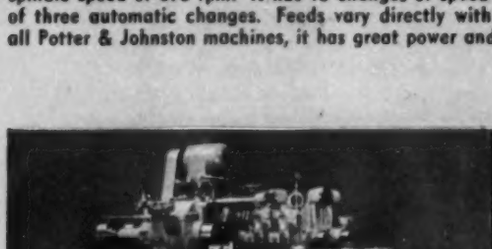
4-D H.S.

5-DELX



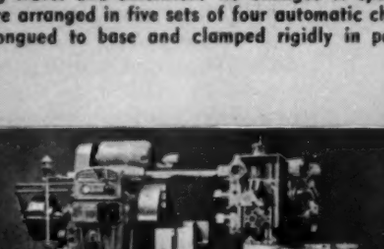
4-D H.S Here is a high speed automatic turret lathe with a maximum spindle speed of 696 rpm. It has 15 changes of speed arranged in five sets of three automatic changes. Feeds vary directly with spindle speed. Like all Potter & Johnston machines, it has great power and exceptional rigidity.

5-DELX. The 5-DELX is a modification of the standard type 5-D Pow Flex having elevated long travel and extension. 20 changes of speed tween 16 and 304 rpm. are arranged in five sets of four automatic chan Ways are tooled steel tongued to base and clamped rigidly in positi



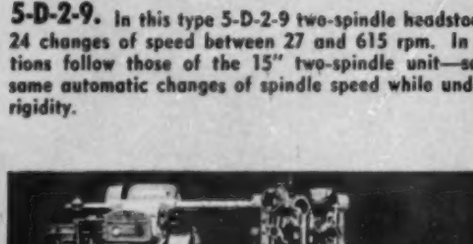
5-D-2-9

6-DRE H.S.



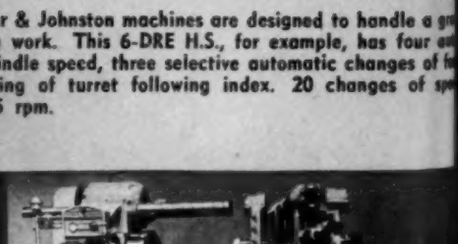
5-D-2-9. In this type 5-D-2-9 two-spindle headstock Power-Flex there are 24 changes of speed between 27 and 615 rpm. In general, the specifications follow those of the 15" two-spindle unit—same rigid construction, same automatic changes of spindle speed while under cut, and same great rigidity.

6-DRE H.S. Potter & Johnston machines are designed to handle a gr variety of machining work. This 6-DRE H.S., for example, has four au matic changes of spindle speed, three selective automatic changes of f and automatic binding of turret following index. 20 changes of sp between 12 and 305 rpm.



6-DREL

8-DXT



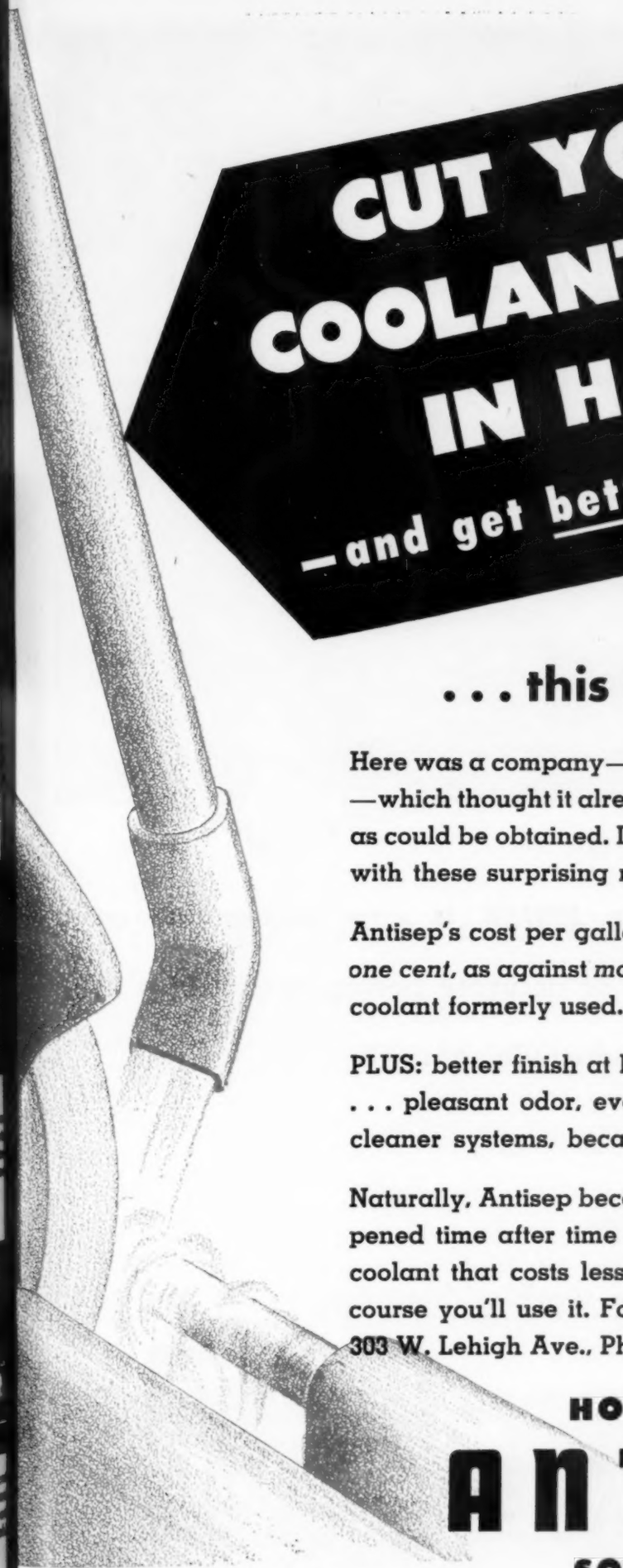
6-DREL. The general specifications of the 6-DREL follow those of the 6-DRE Automatic Turret Lathe, except that this unit has an extended bed. It has automatic changes of spindle speed, selective automatic change of feed and automatic binding of turret following index. Powerful, rigid and rugged.

8-DXT. This extended capacity automatic turret lathe has two changes of speed between 7 and 160 rpm. and five sets of four automa changes. Feeds vary directly with the spindle speed. Turret is automa cally clamped into position after indexing. It is an efficient, depend performer.

SEND FOR CATALOG 1a/25a GIVING FULL SPECIFICATIONS.

POTTER & JOHNSTON MACHINE CO.

PAWTUCKET, RHODE ISLAND



CUT YOUR COOLANT COST IN HALF

—and get better machining!

. . . this company did!

Here was a company—nationally known for aircraft parts—which thought it already had as good a grinding coolant as could be obtained. It agreed to test Antisep Soluble Oil, with these surprising results:

Antisep's cost per gallon of diluted coolant was less than *one cent,* as against *more than two cents* per gallon for the coolant formerly used.

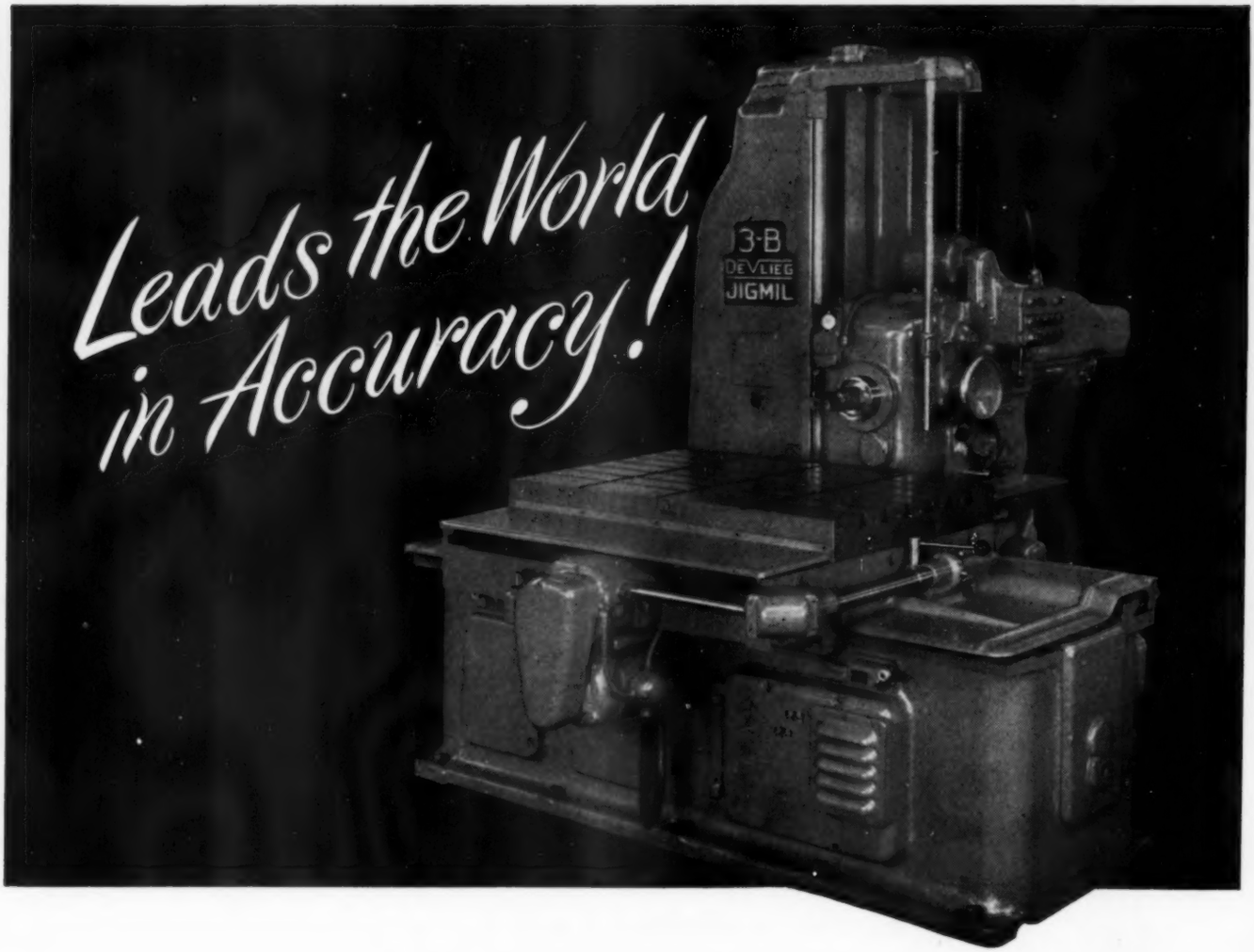
PLUS: better finish at higher dilutions . . . cleaner wheels . . . pleasant odor, even after week-end shut-downs . . . cleaner systems, because of its cleansing properties.

Naturally, Antisep became the standard—which has happened time after time over the nation. When you find a coolant that costs less and results in better grinding, of course you'll use it. For test, write E. F. Houghton & Co., 303 W. Lehigh Ave., Phila. 33, Pa., and all principal cities.

HOUGHTON'S

ANTISEP

SOLUBLE OIL



The DeVlieg JIGMIL is now recognized as The World's Leader in the field of accurate boring, in addition to its unique capacity for high productivity on:

1. **Single part precision boring.**
2. **Tool, jig and die work.**
3. **Repetitive production work without jigs.**

Write today for new descriptive booklet.

DeVLIEG JIGMIL

DeVLIEG MACHINE COMPANY

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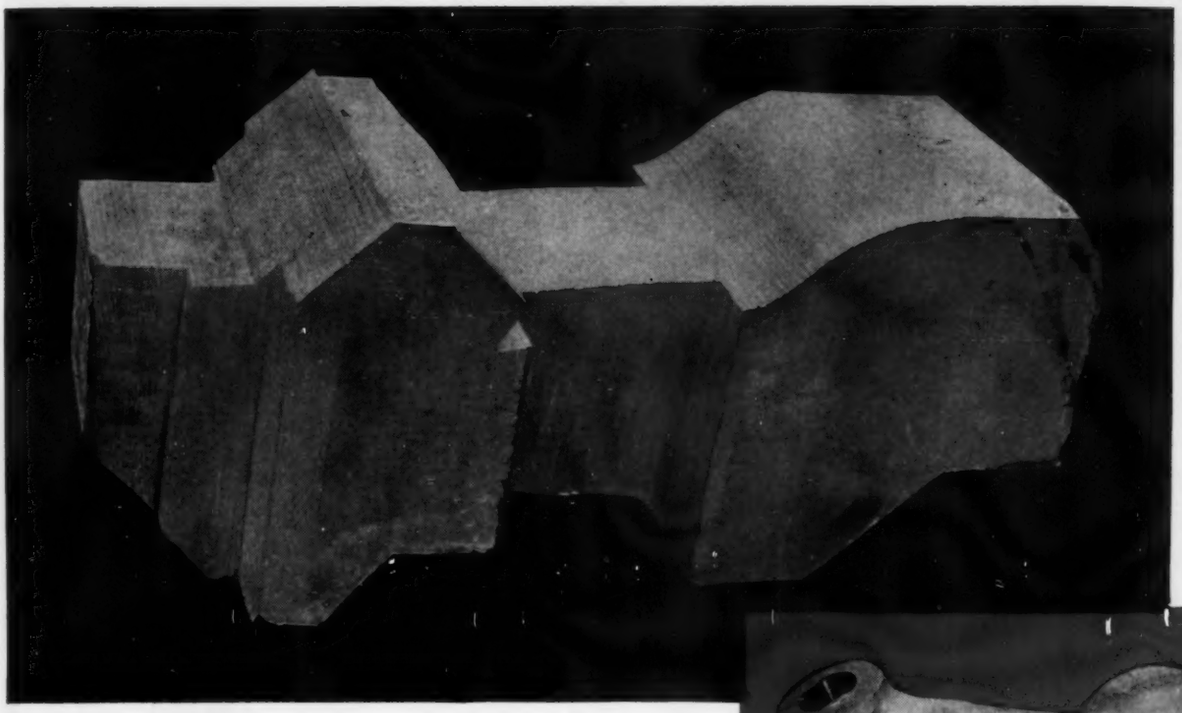

On those FEW-OF-A-KIND JOBS,

save yourself a lot of hogging . . .

Use Alcoa Aluminum Hand Forgings

185 pounds of aluminum were cut off this Alcoa Aluminum Hand Forging before the customer's machine shop received it. Instead of ordering a 450-pound solid aluminum block to make this 100-pound experimental landing gear trunnion, he ordered this Alcoa Aluminum Hand Forging that weighs only 265 pounds.

When you build experimental models or few-of-a-kind parts, order Alcoa Aluminum Hand Forgings and save time and money. The general shape can be blocked out for you . . . no costly forging dies are needed. And because no dies are required, you can get Hand Forgings in a hurry.

You save unproductive hogging and machining that ties up machines and man power. You get stock that is solid throughout. Tensile strength is high . . . up to 82,000 psi. tensile. Machining goes fast.

We'll be glad to show you how to speed production and save money by using Alcoa Aluminum Hand Forgings for short-run parts where high tensile strength is needed. Write to ALUMINUM COMPANY OF AMERICA, 2107 Gulf Bldg., Pittsburgh 19, Penna. Sales offices in 54 leading cities.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

IN EVERY COMMERCIAL FORM

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YEARS

of Fine Tools

In 1848 in Fitchburg, Mass., a business venture was formed to manufacture knives and other cutting tools. Six years later, Augustus Whitman became a partner in this small company. The enterprise prospered, and when in 1877 it merged with George Barnes and Co. of Syracuse, N. Y., the names of WHITMAN and BARNES first became coupled together.

In the decades which followed, Whitman & Barnes manufactured many diversified products—all in keeping with demands of the times. In 1891 twist drills were added. Now drills, reamers and certain other metal-cutting and piercing tools make up the company's products. From its original inception—one hundred years ago—the company has manufactured only the very best in quality—and in 1948, on its one-hundredth anniversary, Whitman & Barnes dedicates its future to a continuance of this same policy of manufacturing only the finest of tools!

W&B

WHITMAN & BARNES

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Why they think of WARD when it's SPRING STEEL

- **BLUE TEMPERED SPRING STEEL**

  Many Hundreds of Sizes

  .002" to .065" in thickness—.95 to 1.05 Carbon

  — 48-51 Rockwell

- **COLD ROLLED ANNEALED SPRING STEEL**

  .003" to .183" in thickness—.70 to .80 Carbon

  — .90 to 1.05 Carbon

CLOSE TO A THOUSAND SIZES IN STOCK — AND COMPLETE SLITTING AND SHEARING EQUIPMENT ENABLE US TO FILL PROMPTLY THE MAJORITY OF ORDERS RECEIVED

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WAREHOUSE SHIPMENTS ONLY ON THE ABOVE SPRING STEELS

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TELEPHONES:
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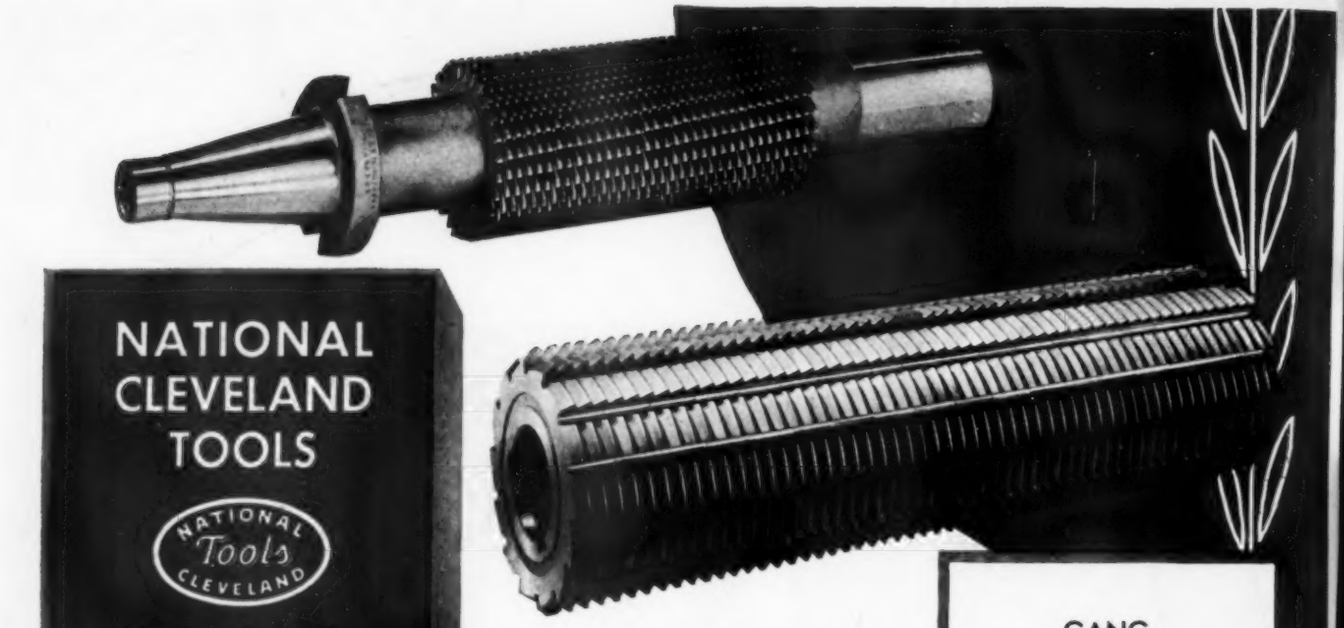

NATIONAL CLEVELAND TOOLS

NATIONAL Tools CLEVELAND

Cutting Tools for All Purposes

GANG MILLING CUTTERS for Production Milling

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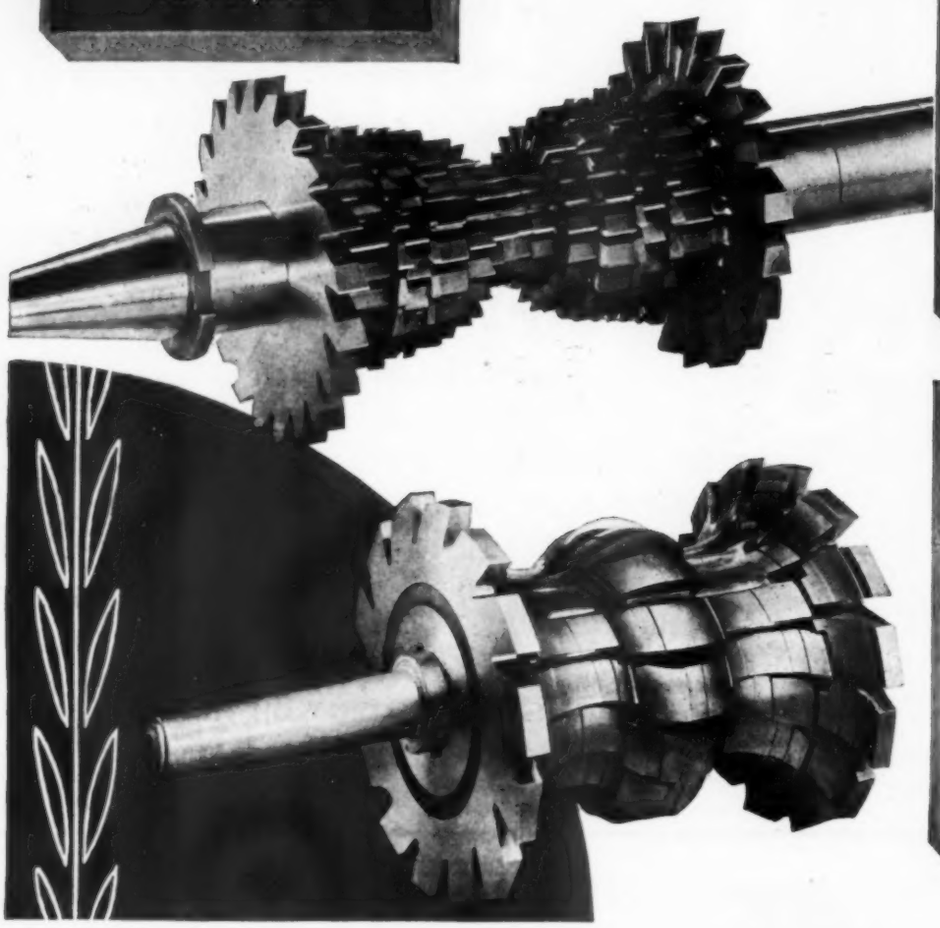
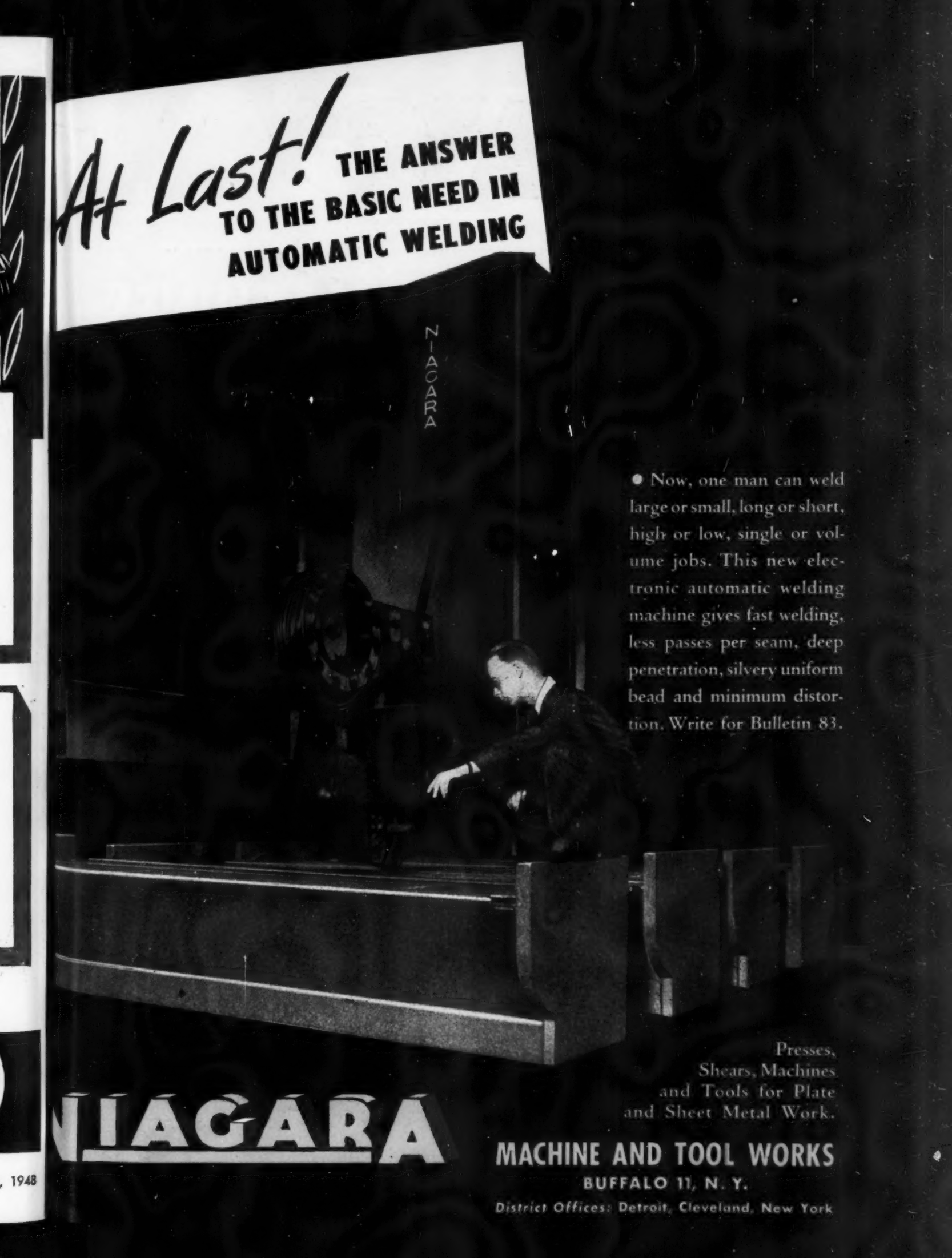
FORM RELIEVED and PROFILE GROUND



Herringbone Cutters, Broaches, Gear Cutters, Gear Shaper Cutters, Circular and Flat Form Tools, Form Relieved Cutters, ground and unground, Hobs, ground and unground, Milling Cutters, Special Tools

NATIONAL TOOL Co.

11200 MADISON AVE — NATIONAL Tools CLEVELAND — CLEVELAND, OHIO


At Last!
THE ANSWER
TO THE BASIC NEED IN
AUTOMATIC WELDING
NIAGARA
• Now, one man can weld large or small, long or short, high or low, single or volume jobs. This new electronic automatic welding machine gives fast welding, less passes per seam, deep penetration, silvery uniform bead and minimum distortion. Write for Bulletin 83.
NIAGARA
Presses, Shears, Machines and Tools for Plate and Sheet Metal Work.
MACHINE AND TOOL WORKS
BUFFALO 11, N. Y.
District Offices: Detroit, Cleveland, New York

NIAGARA

PRESSES, SHEARS, MACHINES
and tools for plate and sheet metal work

Slip Roll Former

Double Seamer

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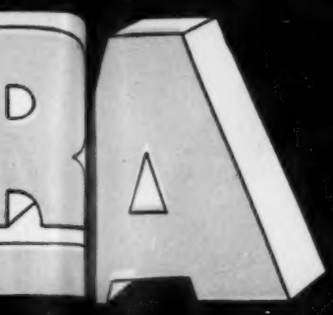
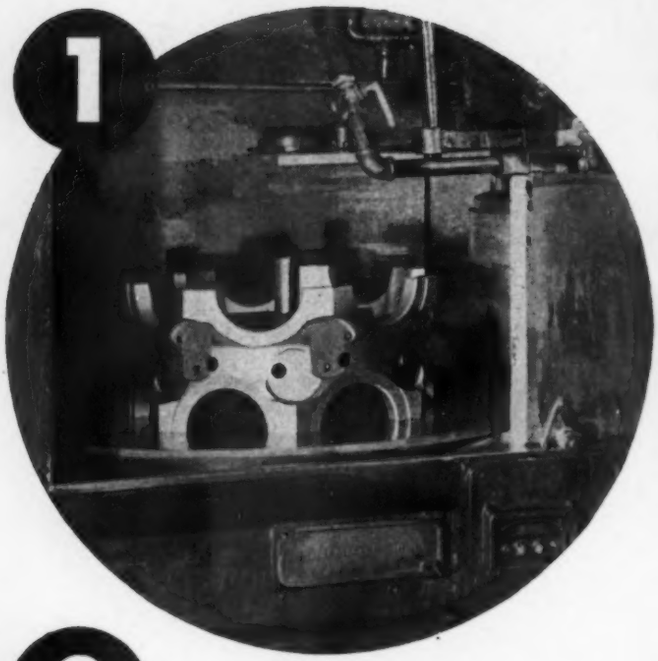


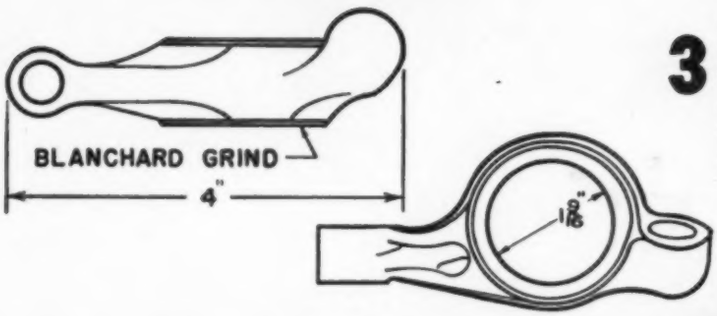
Combination machine for burring, turning, wiring, beading, crimping, slitting and circle cutting.

• The complete line of Niagara machines for sheet metal working provides equipment for production, maintenance and job work in large plants and small shops. They assure well coordinated setups for shearing, blanking, forming, seaming, flanging and many other essential operations. Write telling us your requirements and we will send you Bulletins on machines and tools for your work.

Circle Shear and Flanger

ORK DISTRICT OFFICES — NEW YORK • CLEVELAND • DETROIT





Here are three illustrative examples of the use of Blanchard Grinding in the aircraft engine industry... to produce a quality product, in quantity, at the *lowest cost-per-piece.*

1 Aluminum CRANK CASE SECTION: Ground on a No. 18 Blanchard Surface Grinder. Finish ground on one side—leaving the surface parallel to the bottom and so flat that no lapping is required for a metal-to-metal pressure-tight joint.

2 Steel PISTON PINS: Both ends ground on a No. 16A Blanchard in a special fixture designed and made by Blanchard. Stock removal is .010" to .015". Thirty years of solving flat surface grinding problems — to our customers' profit—qualify us to do your special tooling—at a very reasonable cost.

3 Steel Forged ROCKER ARMS: Rough ground on a No. 16A Blanchard in a special Blanchard-designed-and-made fixture. Stock removal is 1/32" to 1/16" from face of steel pin boss. There's many a profitable reason why — in FLAT SURFACE GRINDING — it pays to "Put it on a Blanchard".

Send for your free copy of "Work Done on the Blanchard", third edition. This new book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

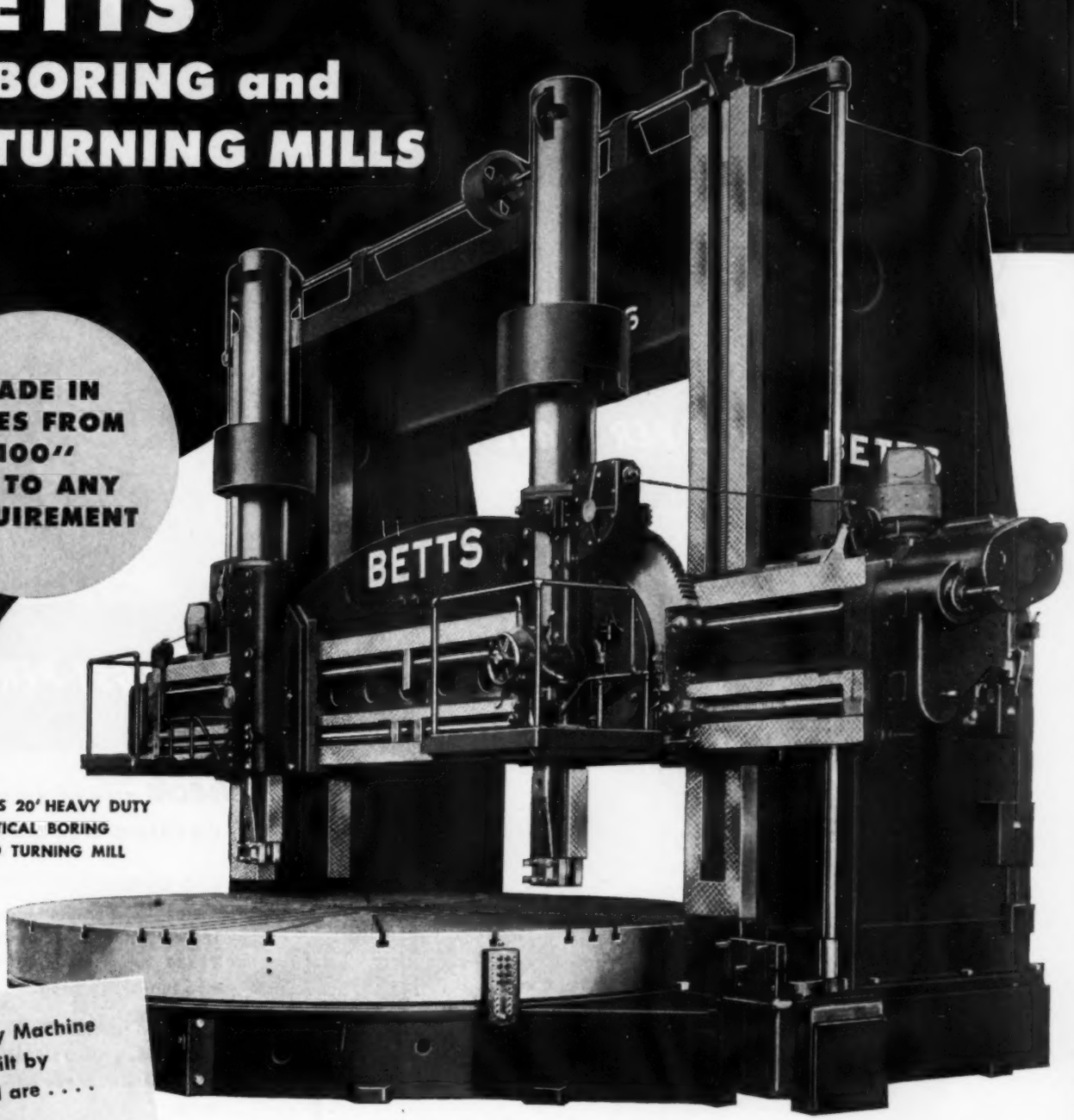
BLANCHARD

The BLANCHARD MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

BETTS
BORING and TURNING MILLS

MADE IN SIZES FROM 100" UP TO ANY REQUIREMENT



BETTS 20' HEAVY DUTY VERTICAL BORING AND TURNING MILL

Among Heavy Machine Tools built by Consolidated are . . . .

LATHES
BORING MILLS
DRILL PRESSES
MILLING MACHINES
BORING MACHINES
COLD SAW MACHINES
BORING, DRILLING AND MILLING MACHINES
DRILL AND TOOL GRINDERS
PLANERS
SLOTTERS
RAILROAD SHOP TOOLS
AUTOMOTIVE TOOLS
AND OTHER SPECIAL MACHINES

Betts Heavy Duty Boring and Turning Mills are general purpose tools of simple, rugged design particulary adapted to heavy continuous operations requiring a high degree of accuracy combined with power. Among the outstanding features that have made Betts Mills leaders in their field, is their type of table mounting that insures positive concentricity. They are built in a size range from 100" swing up to any size to meet your requirements.

Full information covering any size Betts Boring and Turning Mill in which you are interested will be furnished upon request.

BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848

BETTS • BETTS-BRIDGEFORD • COLBURN • HILLES & JONES • MODERN • NEWTON • SELLERS

CONSOLIDATED MACHINE TOOLS

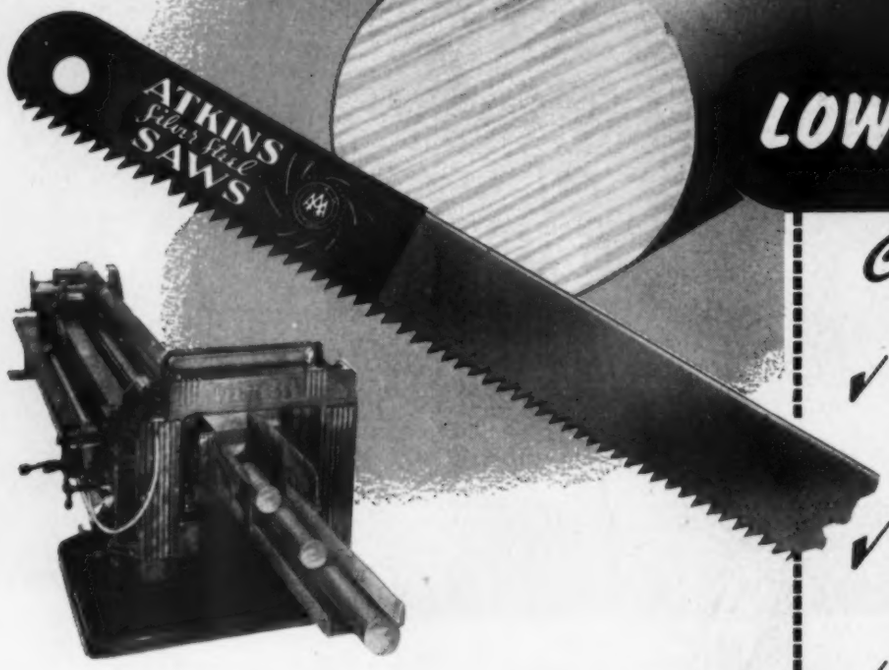
CONSOLIDATED
MACHINE TOOL CORPORATION
ROCHESTER 10, NEW YORK

ATKINS

Silver Steel BLADES

MORE CUTS PER BLADE

LOWER COST PER CUT



Atkins "Silver Steel" Blades in your hacksaw machines mean faster metal cutting at lower cost. Because of famous Atkins "Silver Steel," these blades hold their extra-keen tooth-edge longer. How this pays off in more cuts per blade, lower cost per cut and less time lost in blade changing is illustrated in the reports at right.

To see how you can speed your own production . . . cut your down-time . . . save your dollars . . . check with your distributor today. Ask him to have an Atkins Cutting Engineer arrange an actual demonstration on work of your own choice.

Check THESE TYPICAL CUTTING REPORTS

✔ **160 CUTS**
Atkins "Silver Steel" Blade made 160 cuts through 6" diam. S.A.E. X1335 (approximately 4512 sq. ins.) Blade still good.

✔ **4270 SQUARE INCHES**
After cutting 4270 sq. ins. of S.A.E. X1335 Atkins Blade still good for more.

✔ **32 CUTS**
Atkins Blade made 32 cuts through 4" dia. stainless steel (Type No. 303) at average 12" per cut.

✔ **610 CUTS**
After 610 cuts on 3" S.A.E. X1335 Atkins Blade in good condition.

✔ **165 CUTS**
After 165 cuts through 6" diam. S.A.E. X1335 Atkins Blade in good condition.

See Your Industrial Distributor First

AAA TRADE MARK ATKINS "ATKINS ALWAYS AHEAD"

E. C. ATKINS & COMPANY • *Home Office and Factory:* **424 S. Illinois St., Indianapolis 9, Indiana**
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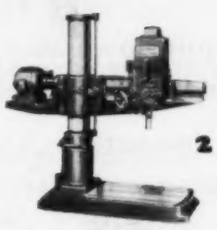
MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

Power and Hand Blades **Milling Saws** **Slitting Saws** **Segmental Cold Saws** **Metal Cutting Bands**

Which SUPER SERVICE will suit your JOB?

For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs more efficiently. Our engineers will help you select the proper machine for your work, or if you prefer, send for any or all of the bulletins pertaining to the machines that interest you.

1. The smallest SUPER SERVICE Radial Drill manufactured by The Cincinnati Bickford Tool Company, as described in Bulletin R-26A, has a 7½" diameter column and a 2½' arm length. This machine is furnished with 6 speeds and 3 feeds and a 1 HP driving motor.

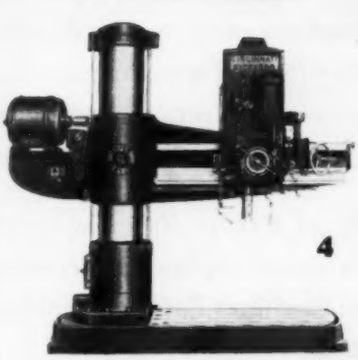


2. The 9" Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21B, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.

3. The new SUPER SERVICE Simplified Radial Drill, as described in Bulletin R-28, is built with a 3', 4' or 5' arm length having 11" diameter column. 12 speeds and 6 feeds are powered with a 5 HP driving motor.

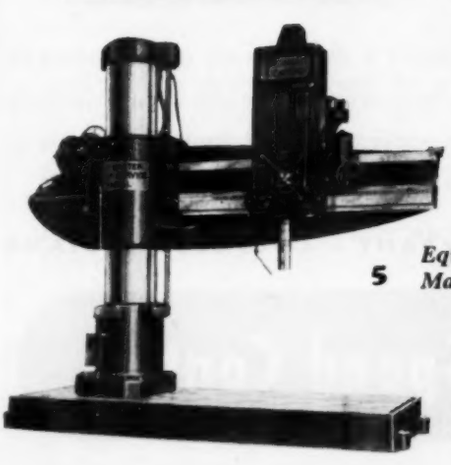
4. The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 11 different standard sizes, ranging from 4' to 8' arm lengths and 13" to 19" diameter columns. These machines are furnished with 7½ or 10 HP driving motors.

5. The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.



6. The SUPER SERVICE Portable Horizontal Drilling Machine with 6 power feeds and 1½ HP driving motor is more fully described in Bulletin HR.

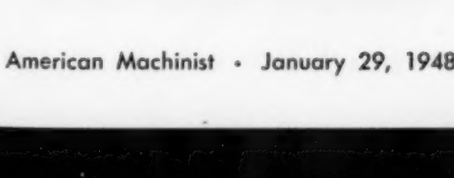
7. The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.



8. The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.

9. The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 8 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.

10. The SUPER SERVICE Jig Boring Machine, as described in Bulletin U-26B, is furnished in 12 speeds and 9 feeds with a 3 HP driving motor.



Equal Efficiency of Every Unit Makes the Balanced Machine

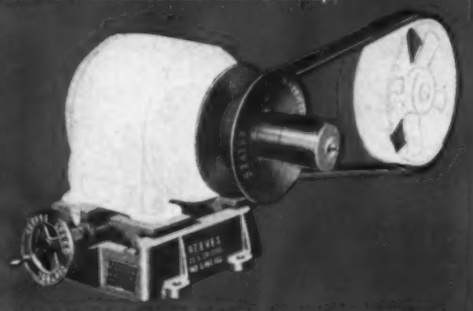
SUPER SERVICE

THE CINCINNATI BICKFORD TOOL CO.

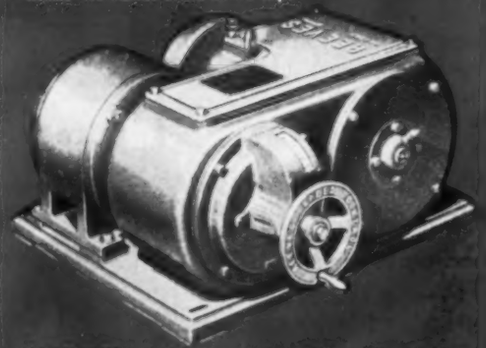
Oakley, Cincinnati 9, Ohio, U.S.A.

Before you select Variable Speed Equipment check these 3 points...

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over wide range—2:1 to 16:1. Sizes fractional to 87 h.p.



VARI-SPEED MOTOR PULLEY converts any standard constant speed motor to a variable speed drive within 4:1 ratio. Sizes to 15 h.p.



MOTODRIVE combines motor, speed varying mechanism and reduction gears in single, compact unit. Speed variation 2:1 to 6:1 inclusive. Sizes to 15 h.p.

To assist you in determining the REEVES unit best suited to your own particular needs, you'll want the complete information contained in the 114-page catalog A-450A.

Before selecting the type of variable speed equipment you'll want for the machines you build or operate, first consider these three points:

1. Is the equipment easy and inexpensive to maintain and service . . . without special tools or specialized training?
2. Is the equipment dependable . . . time-tested by a wide variety of applications on production machines?
3. Does the manufacturer of the equipment provide adequate engineering and service facilities?

Here is how REEVES answers these three questions:

FIRST: REEVES Variable Speed Drives are simple in design and rugged in construction, employing a time-tested principle of V-belt driving between semi-steel discs which are adjustable to form an infinite number of diameters. REEVES Speed Control units have few moving and wearing parts . . . employ force-feed lubrication . . . need little maintenance and require no special tools or specialized training to service.

SECOND: The dependability of REEVES Variable Speed Drives has been proved by successful application on more than 260,000 REEVES-equipped machines now in operation in some 25,000 widely diversified industrial plants.

THIRD: REEVES maintains a nation-wide organization of speed control experts whose services are always available to assist you in the correct application and trouble-free operation of REEVES Variable Speed Drives.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

Variable

REEVES Speed Control

The Right Speed for Every Job

Spot American Machinist's NEWS OF METALWORKING

American Machinist's Index of Metalworking Production, making its debut this issue, reached a new peacetime high in December at 226 (1939 equals 100). This compares with 223 in November and with 1947 low spot of 206 in July and August. For details, turn to page 306.

An employer's right to discharge a union organizer who spreads false information about his company's wage policy among fellow employees has been presented to NLRB by Westinghouse.

$60 million will be spent by a large motor car maker to tool up for its 1949 models. Cost of the program is estimated at three times the amount necessary to do the same thing in 1939. Expenditures must be amortized in a year.

New list prices, restoring customary discounts, will be announced shortly by some makers of mill supply items. Reason: increased prices the past year or two made it necessary to quote the old base prices plus a certain percentage. Bad psychological situation was created, building customer resistance.

An automobile company is reported developing a "prefab" bungalow 20x40 ft. with two bedrooms, living room, kitchen and bath, with full basement. If it can be built cheaply enough, plans are to mass produce it like automobiles. Metal-clad walls, with 4-in. cellular insulation between sheet metal faces, will be used. Main deterrent now is sheet steel shortage.

> **Sides of hills or mountains are most desirable sites for underground plants, according to McGraw-Hill study in European countries and Japan. Reasons: dryness, relative freedom from trouble with ground water, easy installation of sewage systems, good ventilation, good entrances and exits. Light metalworking products are well suited to underground manufacture. Germany had 143 underground plants operating by V-E Day.**

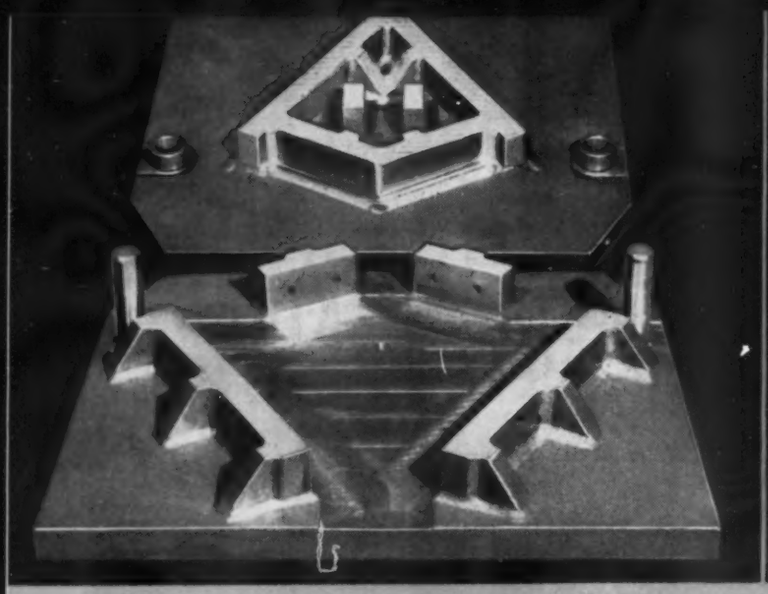
Some selective plants to be built this year may be allowed five-year amortization for tax purposes. If so, they will be chosen on basis of (1) easing current critical shortages, (2) aiding military preparedness, or (3) expediting the Marshall program.

Price from now on will be major criterion in issuance of export licenses by Office of International Trade. Lowest price will be favored to stretch available dollars in hands of importing nations and to restrain inflationary pressure by excessive mark-ups in export prices. End use abroad, however, will continue an influential factor.

Anticipating shortage of ash for wooden station-wagon bodies, prominent automobile concern had lumber cruisers cover the territory from Maine to New Mexico, purchasing standing timber. Ash later was shipped to saw mills and processed. Result: 5000 station wagons were built in '47 instead of the 500 scheduled. Car volume was increased without use of more steel.

Failure of a union to qualify under Taft-Hartley law will not bar Federal Mediation and Conciliation Service from intervening in a dispute. If dispute involves a union's right to represent the workers, FMCS will keep hands off unless national safety and health are imperiled.

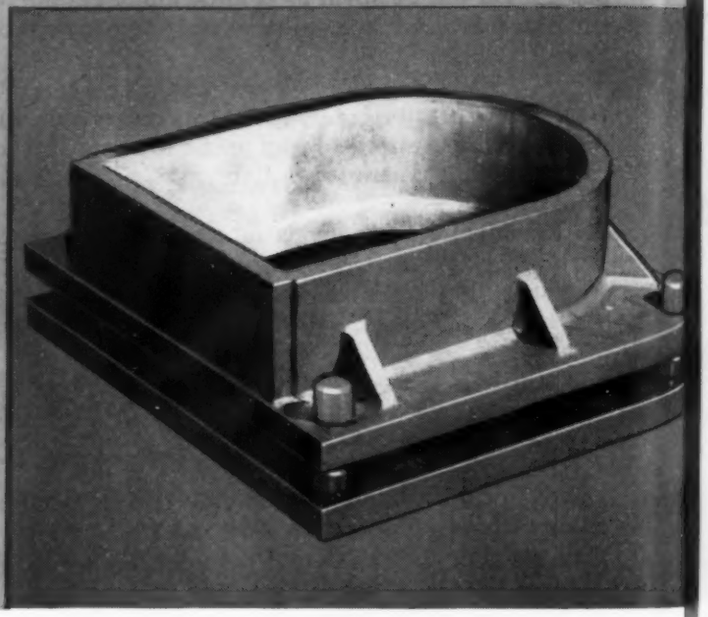
This strictly isn't metalworking news, but its powerfully important: there's one country in the world in which the cost of living is going down rather than up—Italy. It is the result of the government's policy of controlled deflation, particularly quantitative restrictions on bank credit (what Chairman Eccles of Federal Reserve Board has been plugging for in this country).



DANLY SPECIAL-PURPOSE DIE SETS

DIFFERENT SIZES
DIFFERENT SHAPES
DIFFERENT PURPOSES

The same DANLY Precision



THE design, shape, size of a die set is determined by its purpose. Many tool designers and engineers have found that only *specially* designed and constructed die sets can do the job efficiently. Torch cut pockets, slots, bored die pockets, planed or milled keyways, drilled knockouts, slug or hold-down holes, welded steel mounting pads—all of these operations and more can be performed at Danly during production of the die set.

This service can be especially valuable to you in the production of large die sets. Additional cutting and welding operations, so easily handled at Danly, may cause difficulty in the die shop or your own tool room where equipment is not specifically suited to large work.

The die sets shown on this page are typical of the kind of work performed in Danly's well-equipped shops. These sets are widely different, but all have the same *Danly Precision*. Freely consult Danly's engineering department for quotations.

DANLY MACHINE SPECIALTIES, INC., 2100 So. 52nd Ave., Chicago 50, Illinois

DANLY *Special* DIE SETS

MACHINED TO YOUR SPECIFICATIONS

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

"Greater Tool Power"

British "working party" committees have just completed the disagreeable task of comparing production in some of our industries with theirs.

The results are sad for the British. Before the war, output per manhour in our manufacturing industries topped Britain's roughly three to one.

The gap didn't narrow appreciably during the war. Our average munitions worker turned out about 2.3 times the amount of his British counterpart.

In cotton textiles, in boots and shoes, in woolen yarn, the same disparity exists today.

Our superior efficiency, concluded the British committees, can be chalked up to "greater tool power provided each worker."

It is a coincidence that these interesting facts are being called to your attention in the same issue in which we are publishing more descriptions of new machines than in any other issue in our history.

During 1947, American metalworking companies announced almost 1500 new tools, parts and accessories. All of these new products are intended to put greater tool power into the hands of individual workers, thereby increasing their productivity.

These new tools already are being bought by the metalworking industries. Many of them are at work this minute. They are helping to cut costs at a time when one of industry's chief jobs is to try to prevent prices from skyrocketing.

Each worker, by the use of these new tools, can produce more per hour to counterbalance the all-time high wage rate which he is being paid.

Companies content to go along with the same old machines may find themselves, before they realize it, in a bad spot like the British. They will be outstripped by their shrewder competitors, who appreciate the full value of possessing "greater tool power" as they head into a buyer's market.

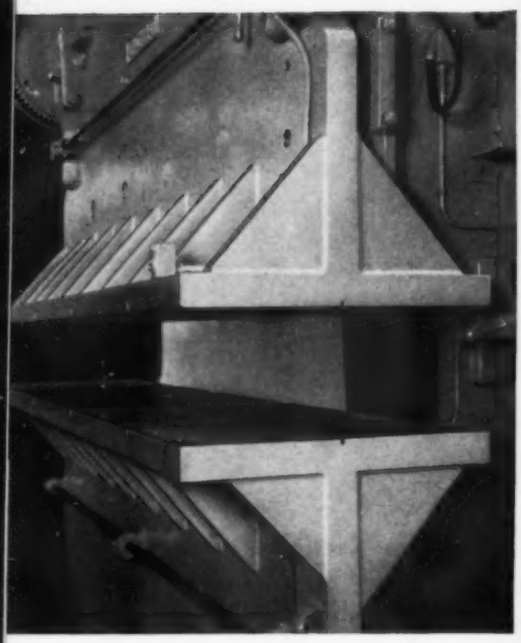
"Greater tool power" isn't a mythical expression. It isn't merely a theoretical term for professors and students to bandy about. It is the down-to-earth explanation of why America today is the unchallenged economic leader of the world.

If the greater tool power now available is put to use as it should be, by all of industry rather than by a fraction of it, our future industrial soundness is assured.

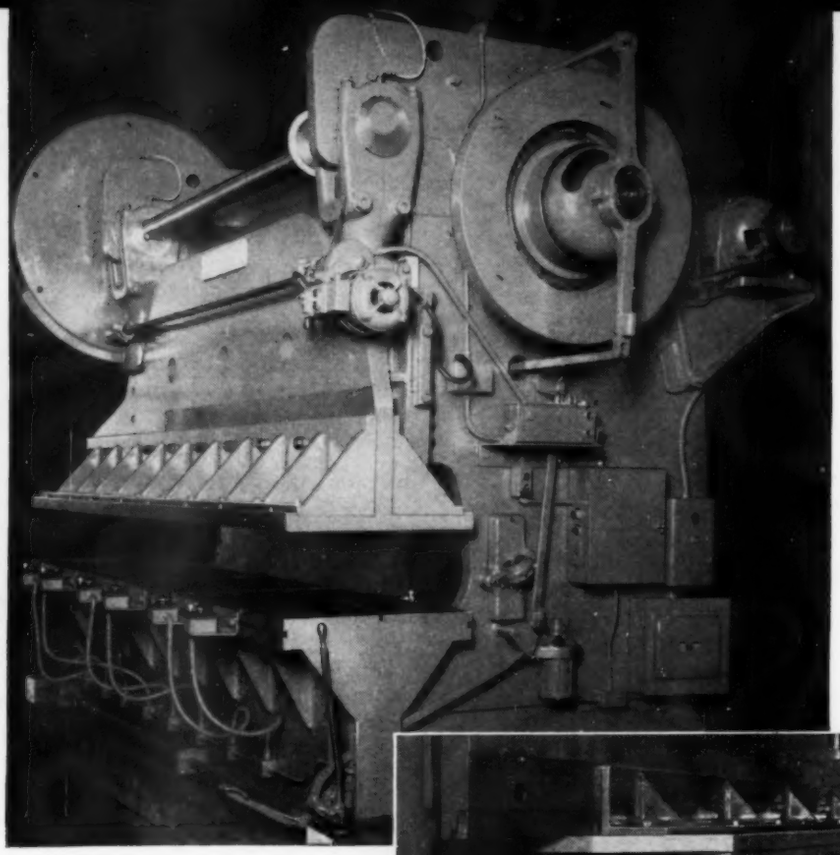
Tomorrow, as today, greater tool power will represent our margin of industrial superiority over the rest of the world. What is more important, it may well spell the difference between prosperity and loss of it here at home.

Burnham Finney

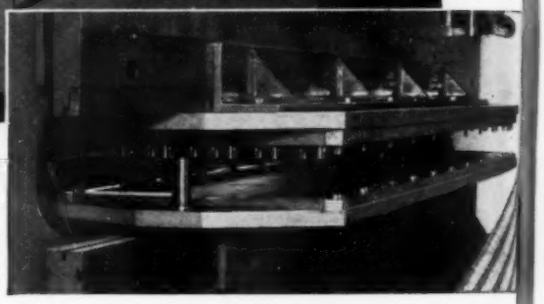
EDITOR



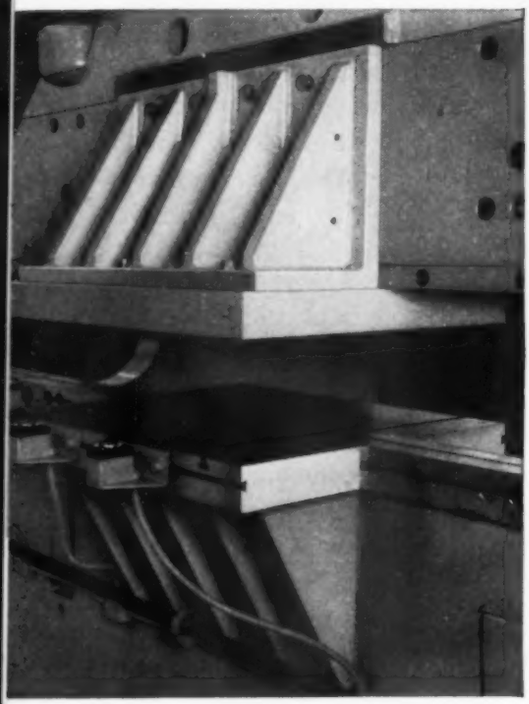
Large area, permanent wide bed and ram for press work



Large area, removable upper brackets



Large area, removable upper and lower brackets



Short, special purpose, removable upper brackets

JUMBO DIE AREAS...

on CINCINNATI PRESS BRAKES

With Cincinnati wide rams and beds, Cincinnati Press Brakes are now being used for both PRESS and PRESS BRAKE work.

These wide rams and beds are of two basic types—the permanent type for Press work only; the removable bracket type for general purpose requirements. With removable brackets, Cincinnati Press Brakes are dual purpose and function as Presses but also retain all the versatility of a Press Brake.

Both removable and permanent types of wide rams and beds are furnished in dimensions and areas to fit your particular requirements. We illustrate some of the combinations available.

Investigate!! Our Engineering Department will be glad to advise you on the profit and production possibilities of this new development in your shop. Write for Catalog B-2.

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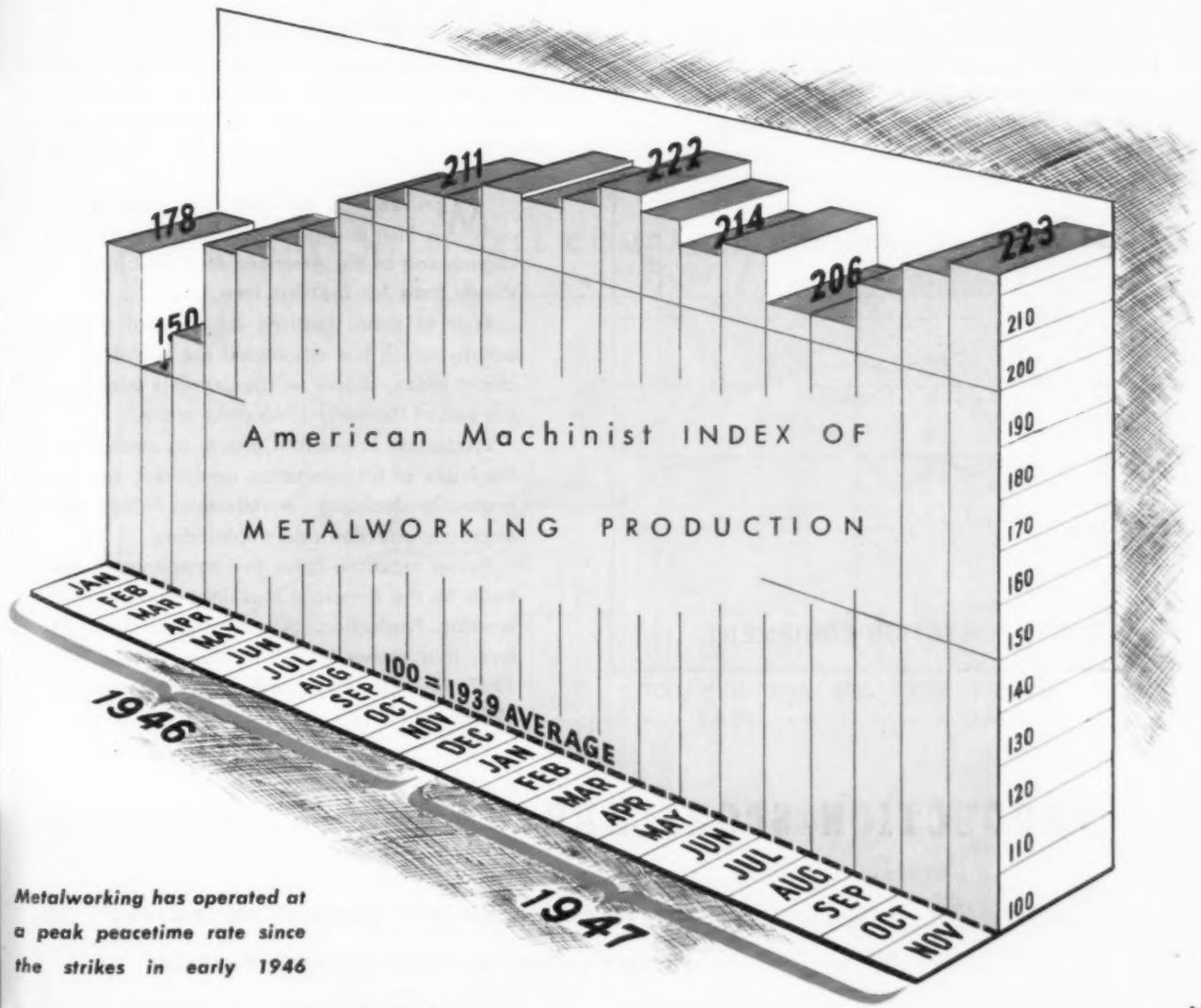
American Machinist's **1948**

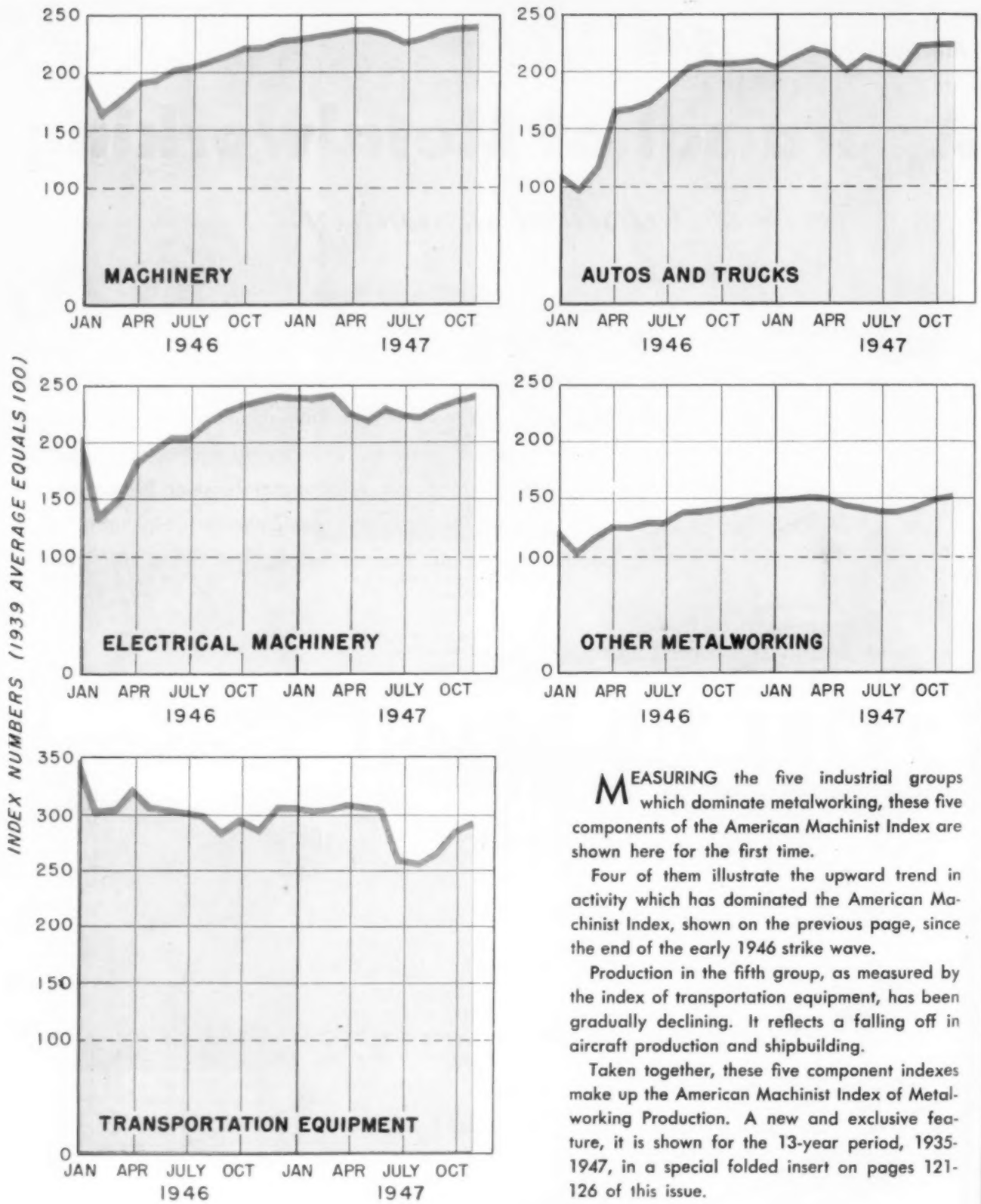
Appraisal of Metalworking

with a statistical summary

● The metalworking industries are entering a lush year. They must meet new production quotas, provide an important share of goods for the Marshall-program countries, adjust to higher wages and try to hold prices down. Where Metalworking stands and how it is ready to do the job ahead are outlined, in facts and figures, in the next 15 pages. The American Machinist Index of Metalworking Production and a survey of outlays for plant and equipment are highlights. Data on production, materials, exports, wages and prices are included



Metalworking has operated at a peak peacetime rate since the strikes in early 1946



MEASURING the five industrial groups which dominate metalworking, these five components of the American Machinist Index are shown here for the first time.

Four of them illustrate the upward trend in activity which has dominated the American Machinist Index, shown on the previous page, since the end of the early 1946 strike wave.

Production in the fifth group, as measured by the index of transportation equipment, has been gradually declining. It reflects a falling off in aircraft production and shipbuilding.

Taken together, these five component indexes make up the American Machinist Index of Metalworking Production. A new and exclusive feature, it is shown for the 13-year period, 1935-1947, in a special folded insert on pages 121-126 of this issue.

PRODUCTION SCORECARD

American Machinist's Production Indexes for principal metalworking industries

1948 to Be Metalworking's Biggest Peacetime Year

NINETEEN FORTY-EIGHT will be the biggest peacetime year in the history of the metalworking industries.

There are three reasons for making such an optimistic statement:

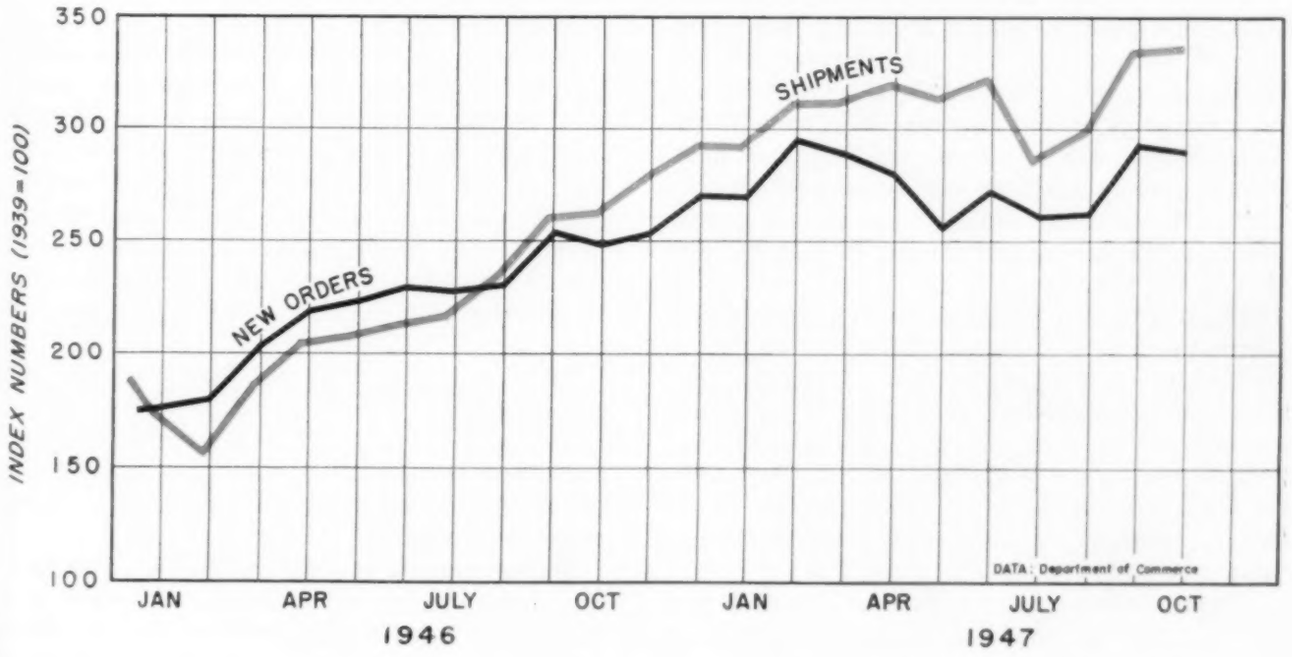
1. All of U. S. industry plans to spend $14.9 billion on new plant and equipment during 1948. A substantial portion of this huge expenditure will be in metalworking products. This total was arrived at by a McGraw-Hill survey which was made by personal interviews with a representative cross-section of American industry. Detailed information about the results of the survey is printed on pages 109-111.

2. The lead taken by the United States in rebuilding European industry will mean heavy demands upon the nation's metalworking industries. Just how far Congress will go in supporting the Marshall program is an open question. It is clear, however, that this country will provide in some manner the dollars needed to buy machinery and other equipment here for European requirements.

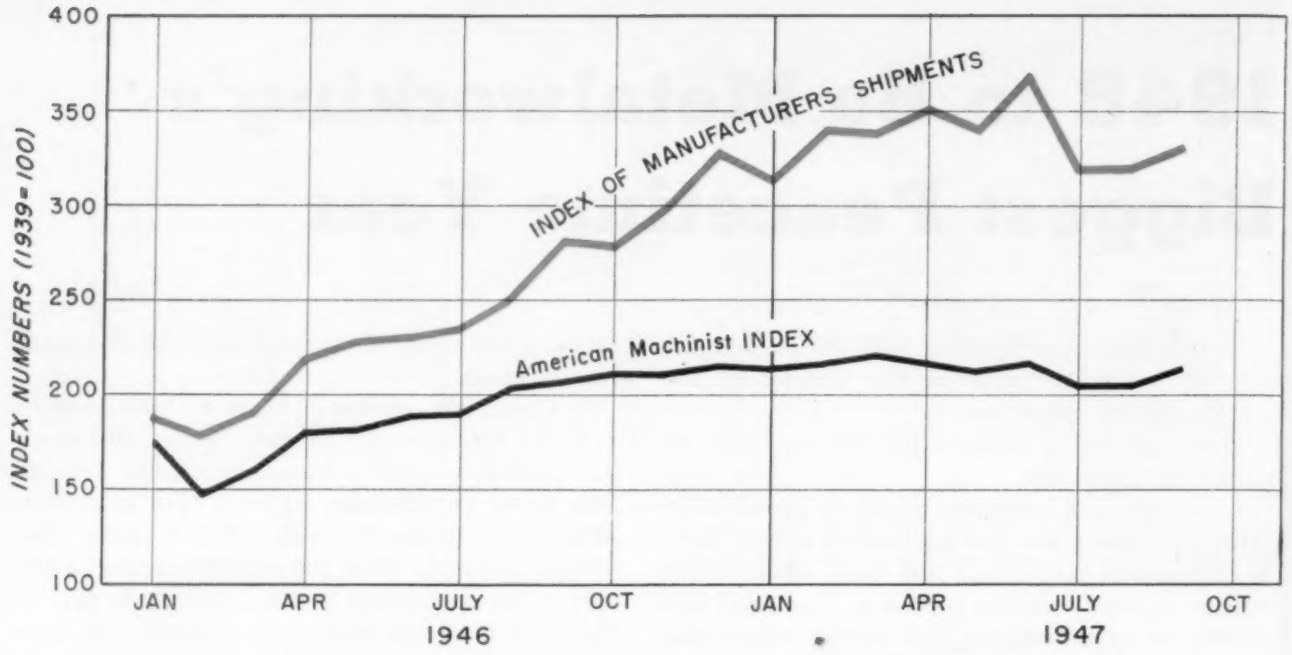
3. Consumer products made of metal—automobiles, refrigerators, electric ranges, dishwashing machines—will continue in strong demand. The motor car industry expects 1948 assemblies of cars and trucks to touch 5,300,000 units. That would make the year the second largest in history. Top executives feel that they can sell all the cars they can make for at least two more years.

Everything will not be rosy, though. For one thing, steel will be short. Nevertheless, production of raw steel will top 1947's record 85 million tons as new plants and new processes come in; and the tonnage of sheet and strip steel going to domestic consumers will be greater than last year, despite export commitments. But as long as business stays as good as it is and as it promises to be, steel will be hard to get. To see where steel went last year and is likely to go in 1948,

NEW ORDERS HAVE HELD WELL COMPARED WITH SHIPMENTS



New orders have continued remarkably strong through 1947. Although shipments have exceeded new orders since the summer of 1946, the gap between the two has not been big



This chart shows how prices of metalworking products have risen. Since midyear 1946 the spread between manufacturers' shipments (based on dollar value) and unit output has widened

turn to page 116 in these special report pages.]

A third round of wage increases will be a trouble-maker. It is true that no long, costly strikes are in sight, but the prospective increases mean higher prices. To help you judge how much wages and prices in your segment of metalworking have gone up, AMERICAN MACHINIST has put together on pages 119 and 120 figures showing what wages and prices have done since the beginning of World War II.

Selling will be a chief job for many companies this year. Though industrialists look for an upturn in business (as revealed by the McGraw-Hill Survey), many metalworking lines already are in a buyer's market. This market is here in machine tools, cutting tools, welding and heat-treating equipment and radios, to mention only a few items. It is near at hand in many other items, as numerous manufacturers will discover before the year is out.

Metalworking management will want to watch these things:

Inventories in your own plant. They are high, over-all, in relation to shipments. With money harder and more expensive to raise, large inventories mean a lot of dollars tied up. Big stocks will be more trouble to carry this year. They should be properly balanced and the totals kept down.

Customer's inventories. They are high. A drop in business would bring a sudden decline in producers' orders. Even if business stays good, big inventories may hide the coming buyer's market until it arrives all of a sudden.

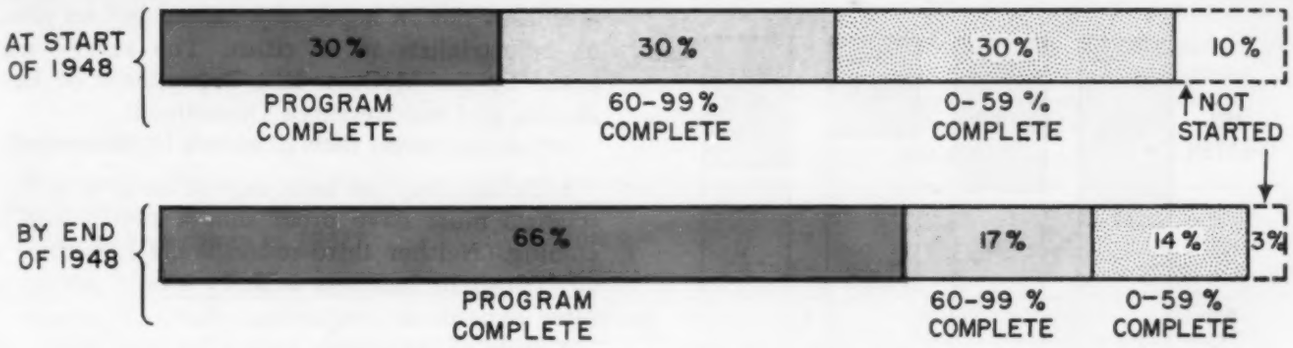
New orders and backlogs. Production has exceeded new orders in many lines of durable goods, resulting in sharp shrinkage of backlogs. Machine tools is a prime example. Metal-cutting tools and fractional horsepower motors also are good examples. Even in power plant equipment, a dent is visible in unfilled orders. Automobile people feel that they can sell all the cars they can make during 1948; and statistics support that claim. But new orders and backlogs should be scanned carefully for trends.

The money market should be watched. While capital for expansion programs will come chiefly from internal sources in manufacturing industries, as the survey of business plans on page 111 reveals, many companies still will need loans to finance operations. Interest rates are hardening, making loans more costly. If the government, through the federal reserve system, should put new checks on credit as an anti-inflation brake, financing may be a real headache this year.

Food production and politics. They are important factors which cannot be assessed accurately up to now. Good crops would ease food prices and reduce inflationary pressures. A tax cut might make our whole economic machine work more smoothly.

Above everything else, mark down this fact: continuing large expenditures for plant and equipment, exports underwritten by the Marshall program, and plenty of money in the pockets of Americans will make 1948 a big year for metalworking.

INDUSTRY'S POSTWAR EXPANSION PROGRAM STILL FAR FROM COMPLETE



Here is how manufacturers report on status of their postwar expansion program

Industry to Spend Almost $15 Billions For New Plant and Equipment in 1948

INDUSTRIAL prosperity will run on in high gear through 1948, and metalworking with it. These are the main conclusions of a nation-wide survey by McGraw-Hill of business plans.

The survey measures plans for capital expenditures on new plant and equipment, because the story of what happens to these expenditures has consistently been the story of what happens to business generally.

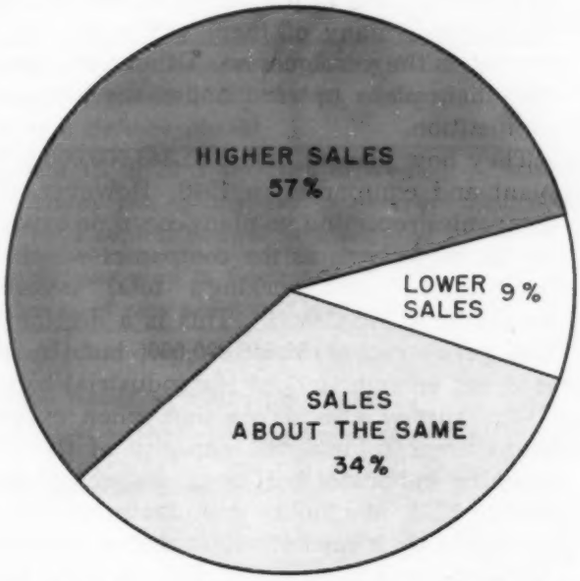
The survey reveals these facts which confirm the belief that 1948 will be a big year:

1. Expenditures for new plant and equipment planned in 1948 total $14.8 billions—only a slight decline from 1947's record $16.1 billion. With capital outlays assured at this high level, general business activity can be expected to remain high.

2. Postwar expansion has more than a year to run. On the average, all manufacturing firms have completed 62% of their programs now, will have finished 85% of them this year.

These facts are drawn from personal inter-

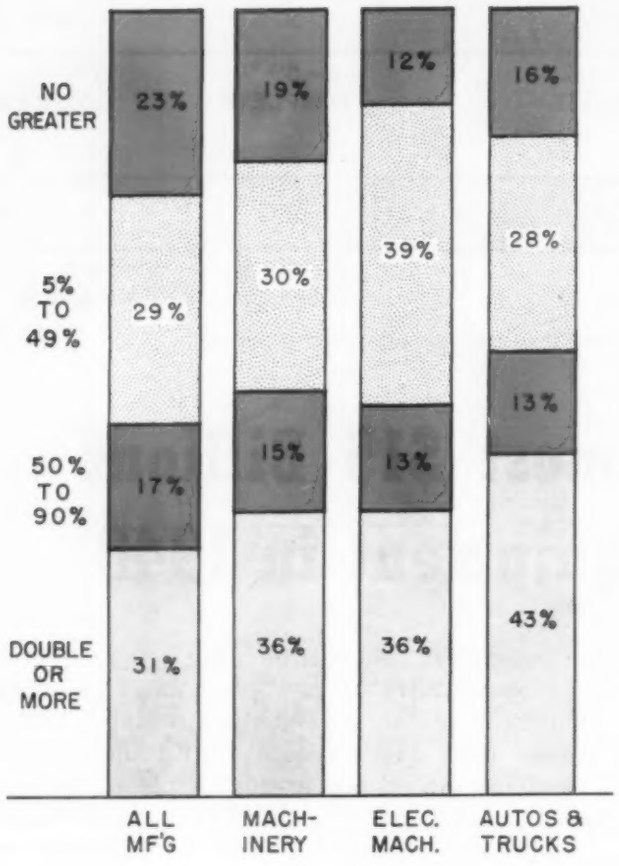
WHAT BUSINESSMEN THINK ABOUT 1948 SALES PROSPECTS



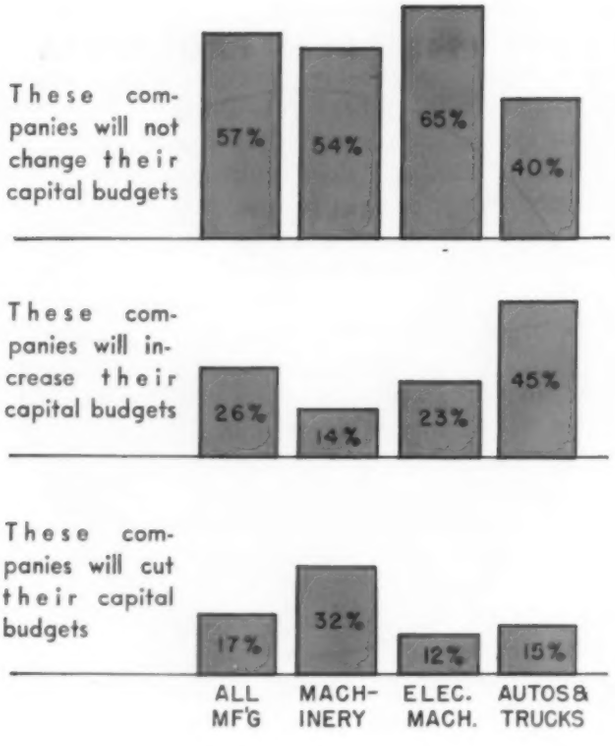
Some 57 percent of U.S. industrialists expect higher sales this year than last

Over half of those expecting a sales gain think it will be more than 20 percent

How Much Plant Expansion?



If Wage Rates Rise 20%...



views with heads of businesses representing a broad cross-section of American industry. They are based not on hopes or hunches, but on plans of industrialists in 95 cities. The survey was made by the McGraw-Hill Department of Economics and the Research Department.

Other important facts disclosed by the survey:

1. Before they cut back capital budgets, industrialists must have proof that a real slump is coming. Neither third-round wage hikes nor a 20% drop in business activity would seriously alter expansion programs.

2. Bulk of the money to pay for new plant and equipment will come from profits and surplus—and not from the investment markets.

3. Sales will be higher in 1948 than in 1947, say more than half of the businessmen. They expect a rise of about 20%.

Metalworking industries as a whole are more optimistic about their sales in 1948 than are other manufacturers. Electrical machinery producers and automobile companies can expect higher sales, according to 68% of the executives representing the two industries. Only 57% of manufacturers as a whole saw sales going up.

Metalworking industries, too, are farther along on their postwar expansion programs than are other manufacturing industries. They have completed, on the average, three-quarters of their postwar expansion. By the end of 1948, they expect to have more than 90% of their planned additions to plant and equipment installed.

To carry through capital programs this year, the metalworking industries are budgeting smaller amounts than they actually spent last year. However, about 40% of the companies reported no plans for 1948 at the time McGraw-Hill made the survey. Many of them will come into the market as the year goes on. Others, too, may revise their plans upward under the pressure of competition.

They now plan to invest $1,345,000,000 in new plant and equipment in 1948. However, if the companies reporting no plans continue expansion on the same basis as the companies which have firm plans, metalworking's total investment would be $1,795,000,000. This is a decline from last year's record $2,456,000,000, but, by itself, it is not enough to dent the industrial boom.

The survey also shows that when expansion plans are complete, the capacity of the metalworking industries will be much greater than it was in 1939. Machinery manufacturers will have increased their capacity 63%. Automobile manufacturers will have added 67% to their prewar capacity, and electrical machinery manufacturers will have enlarged their facilities 63%.

METALWORKING COMPANIES REPORT THEIR PLANS FOR 1948

McGraw-Hill Asked These Questions:		Biggest Metalworking Industries Answered: Machinery	Electrical Machinery	Autos & Trucks	All Manufacturing Companies Answered
Will your company's sales in 1948 be higher or lower than in 1947?	HIGHER	49%	68%	68%	57%
	LOWER	7	4	1	9
	SAME	44	28	31	34
If higher, by what percent?	(MEDIAN)	15%	20%	30%	20%
What proportion of your entire post-war expansion program is complete now?	COMPLETE	44%	46%	6%	30%
	60-99%	27	31	65	30
	0-59%	24	17	28	30
	NONE	5	6	1	10
How much of it will be complete by the end of 1948?	COMPLETE	75%	78%	84%	66%
	60-99%	15	5	13	17
	0-59%	9	12	2	14
	NONE	1	5	1	3
When your postwar expansion program is complete, how much greater will your production capacity be than it was in 1939?	DOUBLE OR MORE	36%	36%	43%	31%
	60-99%	15	13	13	17
	0-59%	30	39	28	29
	NO GREATER	19	12	16	23
How much did you spend on new plant and equipment in 1947?	MILLIONS OF DOLLARS	$1,190	$480	$780	$7,525
How much do you expect to spend in 1948?	MILLIONS OF DOLLARS	$550	$195	$600	$6,056
What proportion of these expenditures has already been placed under contract?	ALL	14%	27%	0%	26%
	60-99%	6	11	3	8
	0-59%	36	43	90	36
	NONE	44	19	7	30
What proportion will be contracted for by June, 1948?	ALL	47%	39%	44%	57%
	60-99%	27	37	20	20
	0-59%	20	24	35	17
	NONE	6	0	1	6
Would you cut these expenditures if business declined 20% (Asked of those who had definite plans)	YES	38%	25%	58%	31%
	NO	62	75	42	69
Would a 15 to 20% increase in wage rates cause you to increase or decrease your 1948 capital budget substantially?	INCREASE	14%	23%	45%	26%
	DECREASE	32	12	15	17
	NO CHANGE	54	65	40	57
How do you plan to finance your 1948 purchases of new plant and equipment?					
What proportion will be raised by: New Issues of stocks and bonds?	NONE	89%	98%	100%	94%
	ALL	6	0	0	2
Commercial bank loans?	NONE	90%	85%	91%	79%
	HALF	2	10	2	7
	ALL	1	2	2	4
Profits, reserves and surpluses?	NONE	7%	2%	2%	6%
	50-99%	8	11	3	15
	ALL	80	85	91	74

MACHINE TOOL ORDERS VS SHIPMENTS (IN THOUSANDS OF DOLLARS)

Month	No. of Reporting Companies	New Orders	Percent Foreign	Unfilled Orders[1]	Percent Foreign	Total Shipments Estimated for Industry
1946						
Jan.	201	$30,580	38.3	$178,141	27.9	$30,263
Feb.	201	21,672	30.1	174,143	29.0	26,949
Mar.	198	28,302	25.2	175,360	29.3	27,326
Apr.	193	32,647	20.5	180,606	28.3	28,108
May	192	28,498	22.3	182,889	27.7	26,580
June	188	28,491	32.7	183,457	29.7	28,580
July	188	26,476	29.6	185,058	29.1	22,360
Aug.	187	26,291	22.4	182,439	29.5	26,911
Sept.	185	23,088	21.2	179,797	29.7	25,468
Oct.	185	22,664	25.9	175,984	30.0	29,140
Nov.	184	19,200	33.5	170,127	30.0	26,176
Dec.	182	19,403	30.0	162,083	29.7	27,587
1947						
Jan.	180	18,991	29.3	154,760	30.0	26,542
Feb.	181	16,780	24.7	146,145	30.0	26,765
Mar.	181	19,509	27.0	137,175	29.9	29,012
Apr.	179	18,220	26.9	128,830	30.5	26,857
May	179	20,018	21.2	121,155	31.0	25,791
June	179	23,810	18.9	120,268	30.6	24,383
July	177	22,227	20.6	124,155	28.8	18,924
Aug.	177	16,037	23.5	122,854	28.1	18,520
Sept.	176	16,294	23.0	118,109	27.3	22,285
Oct.	173	20,917	19.8	113,674	26.1	27,545
Nov.	172p	19,448p	15.1p	110,122p	24.6p	24,503p

p—preliminary 1—At end of specified period

SOURCE: National Machine Tool Builders Association

METALWORKING ORDERS AND SHIPMENTS

	Machinery, Including Electrical			Autos & Equip.	Transportation Equip.
MONTH	Shipments (Millions of Dollars)	New Orders (Index, 1939=100)	Percent Change In Unfilled Orders	Shipments (Millions of Dollars)	Shipments (Millions of Dollars)
1946					
Jan.	$ 814	215	+7%	$273	$412
Feb.	808	235	+6	266	354
Mar.	828	240	+7	322	363
Apr.	907	269	+6	442	394
May	954	297	+7	469	399
June	1,043	331	+6	415	385
July	983	295	+5	557	358
Aug.	1,051	292	0	622	329
Sept.	1,184	321	+4	713	382
Oct.	1,174	318	+5	716	364
Nov.	1,287	314	+1	775	362
Dec.	1,415	326	+1	842	403
1947					
Jan.	1,333	308	—1	812	412
Feb.	1,489	344	0	881	408
Mar.	1,489	336	+1	884	394
Apr.	1,501	316	+1	914	430
May	1,509	294	—2	851	433
June	1,616	315	—2	924	482
July	1,391	328	+3	871	357
Aug.	1,436	304	0	832	358
Sept.	1,603	337	0	977	373

SOURCE: DEPARTMENT OF COMMERCE

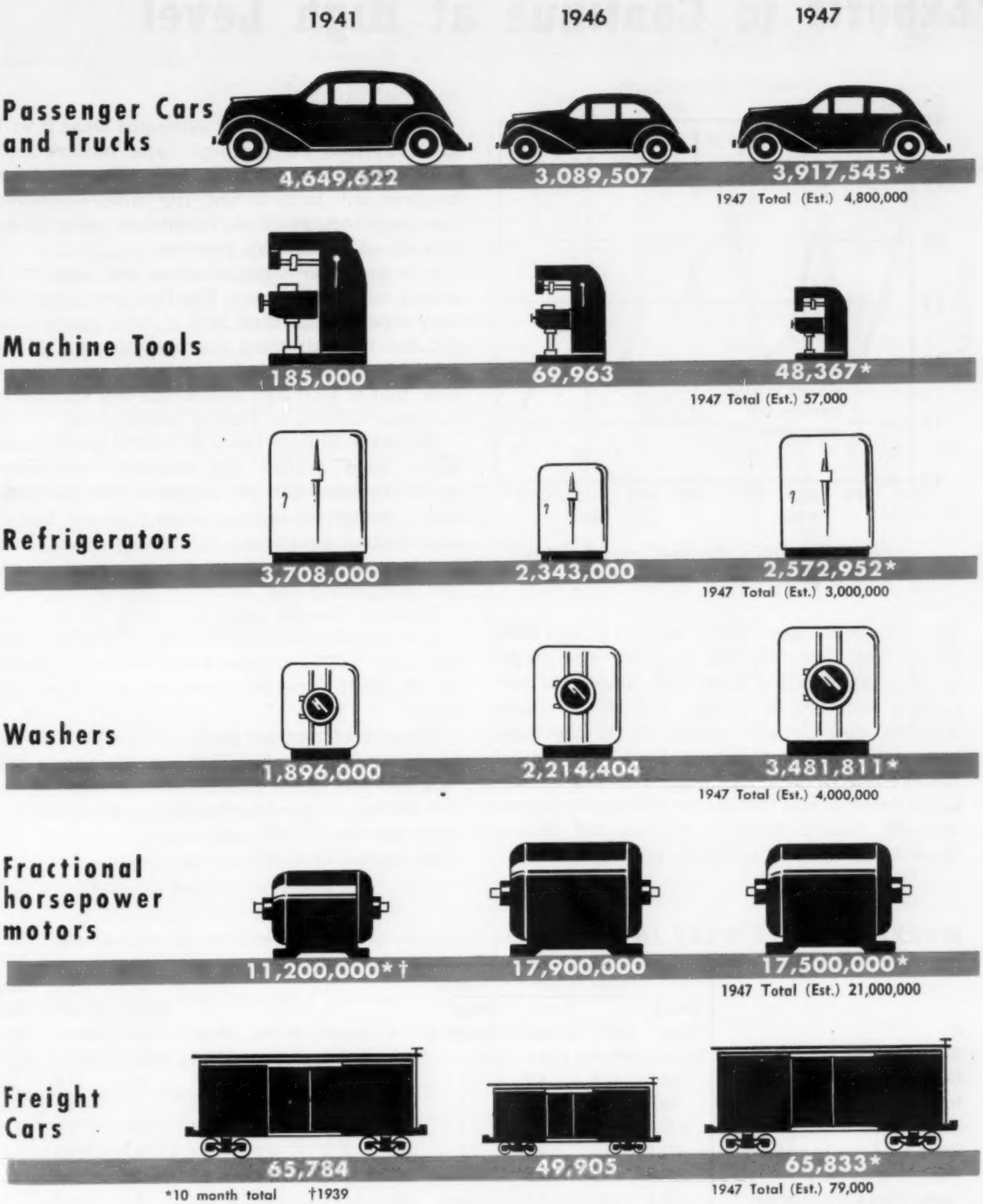
Shipments To Continue Upward

SHIPMENTS of metalworking goods, except transportation equipment, rose in 1947 and are likely to continue upward during 1948. Physical volume will go up slowly, but dollar volume may rise more rapidly because of price advances.

Backlogs expanded in 1947 and then began to level off as shipments caught up with new orders. Shipments in transportation equipment, other than automobiles, declined as aircraft output and shipbuilding fell off.

Automobiles and refrigerators topped 1946 substantially, but failed to come up to the 1941 record figures.

Machine tool production in 1947, though under 1946, surpassed any prewar year by a comfortable margin. The industry enters 1948 with

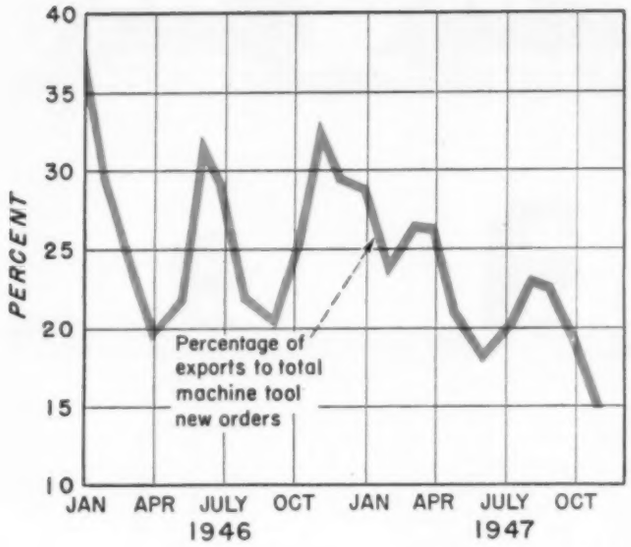


Automobile makers and manufacturers of refrigerators, washing machines, fractional horsepower motors and freight cars made impressive gains in production during 1947

promise of a gain of 15% or more in shipments compared with 1947. A dollar total of $400 million may be reached as a result of expanded sales and price increases.

The good outlook for the machine tool industry is based on these factors: (1) uncompleted expansion programs of metalworking firms; (2) tooling for new postwar models; (3) mechanization of production processes to cut costs; and (4) strong export demand.

Exports to Continue at High Level



DOLLAR SHORTAGES have caused a decline in percentage of machine tool exports

METALWORKING exports will hold at a high level in 1948. The Marshall program will largely offset any decline from 1947. It will bolster exports not only to Europe, but also to Latin America and Canada, where dollar shortages have been limiting buying from the United States. Plans are for us to spend $2.1 billions in Latin America and Canada for Marshall program supplies, thus helping to provide the dollars those areas need to maintain purchases here.

Western Europe has not estimated what it will spend in 1948 for machine tools, construction equipment, and other machinery. The countries involved will have to find the funds wherever they can, because Washington does not plan to give direct aid for this purpose.

It is not clear what machine tool shipments abroad will be this year. The first year after the war, exports comprised 30% of total production, but the ratio dropped sharply during 1947 as available dollars shrunk. It is a safe guess, however, that at least 20% of machine tool shipments this year will go to foreign destinations.

Whatever Europe needs in capital goods—machine tools, textile and canning machinery, steam engines—can be supplied without difficulty, except for several glaring items. One is construction equipment, which is tight. Others are farm machinery, steel mill equipment, timber equipment and electrical equipment.

Western Europe plans to satisfy its own requirements for automobiles. Some 67,000 trucks, however, will be shipped from the United States to Marshall program countries the next two years.

Exports of aircraft parts and accessories are likely to fall off. But U.S. manufacturers will not feel the effect much, because most of the $46 million of these products shipped in the first nine months of 1947 came from government surplus instead of from new products.

WHERE EXPORTS WENT IN 1947

EXPORTS IN MILLIONS OF DOLLARS DURING THE FIRST NINE MONTHS OF 1947

	Grand Total	European Recovery Plan Countries									China and India
		Total	France	United Kingdom	U.S.S.R.	Canada	Mexico	Brazil	Argentine	Venezuela	
TOTAL MACHINERY AND VEHICLES	$3,374.5	$888.4	$243.0	$96.7	$80.5	$483.2	$199.2	$251.9	$267.1	$132.6	$162.2
Electrical Machinery & Apparatus	414.7	47.4	6.2	5.0	14.2	68.5	34.9	46.1	37.2	14.8	26.0
Engines, Turbines and Parts	166.0	41.0	30.2	1.3	4.8	21.5	8.3	15.0	6.6	6.0	22.6
Construction and Conveying Machinery	142.4	27.3	11.8	6.3	6.2	29.3	7.8	8.1	16.4	8.8	3.9
Mining, well & pumping machinery	142.5	18.3	9.3	1.7	10.8	13.4	9.0	3.4	6.7	25.6	5.4
Metalworking machinery	151.6	55.5	17.1	11.4	18.4	17.4	6.1	7.2	7.0	1.8	8.1
Textile, sewing & shoe machinery	91.8	13.7	2.2	5.9	0.8	16.3	8.2	10.4	7.9	1.2	5.2
Other Industrial Machinery	289.6	40.7	8.8	9.9	18.3	54.4	29.3	19.3	12.5	12.2	17.5
Office Machinery	73.6	19.9	0.7	5.9	0.1	9.2	3.1	6.4	9.8	1.8	2.9
Printing and Bookbinding Machinery	22.7	6.4	0.2	1.1	0.7	5.2	1.0	1.8	0.7	1.2	3.0
Agricultural Machinery & Implements	231.7	39.8	14.5	8.7	2.2	76.1	11.8	5.6	15.5	6.7	4.5
Automobiles, parts and accessories	866.8	141.5	8.6	3.5	1.2	143.2	67.9	88.7	114.7	37.9	22.9
Aircraft, parts and accessories	123.2	46.3	9.5	2.5	0.3	9.4	3.2	8.7	12.5	1.6	18.7
Other Vehicles and parts	658.0	390.1	123.7	33.7	2.6	20.6	6.7	31.2	20.1	12.6	21.2

(SOURCE: DEPARTMENT OF COMMERCE)

METALWORKING EXPORTS REACH NEW PEACETIME HIGH

(MILLIONS OF DOLLARS)

	FIRST EIGHT MONTHS 1947	1946	1938
TOTAL MACHINERY AND VEHICLES	**$3,044.9**	**$2,223.7**	**$848.8**
ELECTRICAL MACHINERY AND APPARATUS	371.9	304.3	102.1
Generators	47.9	59.4	5.4
Electrical Distribution Equip.	35.3	25.0	8.5
Motors, Starters and Controllers	28.8	29.6	7.6
Electric Refrigerators and Appliances	90.3	65.3	31.0
Radio Apparatus	93.8	54.5	23.1
ENGINES, TURBINES AND PARTS	154.3	247.7	17.6
Steam Engines, Boilers and Accessories	18.4	13.6	4.0
Internal Combustion Engines	82.9	69.2	7.9
Steam Locomotives and Parts	50.0	162.8	5.5
CONSTRUCTION AND CONVEYING MACHINERY	127.3	84.4	23.9
MINING, WELL AND PUMPING MACHINERY	128.4	101.7	63.6
Mining and Quarry Machinery	33.9	30.5	14.8
Well and Refining Machinery	62.4	47.4	40.6
Pumping Machinery	32.1	23.8	8.2
METALWORKING MACHINERY	138.3	165.7	101.7
Machine Tools	94.3	127.0	64.4
Lathes	23.7	30.8	14.8
Milling and Gear Cutting Machinery	13.6	22.1	17.7
Planers and Shapers	3.7	7.6	2.8
Grinding Machines	16.1	20.7	14.1
Machine Tool Parts and Equip.	17.9	15.0	3.4
Other Metalworking Machinery	35.1	38.7	32.7
Sheet and Plate Metalworking Machinery	11.3	9.1	8.1
Forging Machinery and Parts	5.0	6.2	4.0
Rolling Mill Machinery and Parts	8.7	7.4	10.1
Foundry Equip. and Parts	2.7	2.9	1.9
Hand Tools	8.9	8.7	3.8
TEXTILE, SEWING AND SHOE MACHINERY	82.0	57.4	15.3
OTHER INDUSTRIAL MACHINERY	254.3	185.1	47.8
OFFICE MACHINERY	65.5	50.5	28.9
PRINTING AND BOOKBINDING MACHINERY	19.8	12.6	9.9
AGRICULTURAL MACHINERY AND IMPLEMENTS	205.5	158.4	75.4
Harvesting Machinery	22.3	12.0	9.1
Tractors and Parts	140.6	112.0	51.4
AUTOMOBILES, PARTS AND ACCESSORIES	775.9	551.2	270.4
Motor Trucks, Buses, and Chassis	303.8	231.0	72.2
Passenger Cars and Chassis	226.6	122.5	100.1
Second-hand Autos, Trucks and Buses	24.4	17.0	1.0
AIRCRAFT PARTS AND ACCESSORIES	108.7	115.3	68.2
OTHER VEHICLES AND PARTS	613.1	189.4	24.8
Merchant Vessels	479.1	116.8	2.9
Freight Cars	83.3	36.9	2.2

SOURCE: BUREAU OF LABOR STATISTICS

STEEL SHIPMENTS BY CONSUMING INDUSTRIES

(NET TONS)

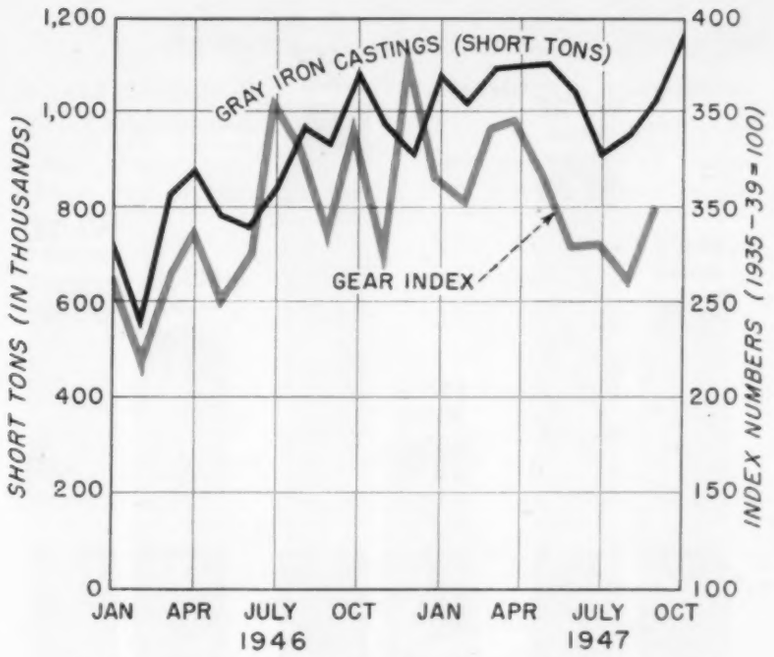
INDUSTRY	1941	1945	1946	1947[3]
1. Steel Converting & Processing				
(a) Wire Drawers & Manufacturers	535,741	575,091	621,094	654,573
(b) Bolt, Nut & Rivet Manufacturers	1,160,767	1,083,464	1,054,717	969,346
(c) Forging Manufacturers				
(1) Auto & Aircraft	385,561	494,781	445,079[1]	313,655[1]
(2) All Other	758,881	1,291,568	651,706	563,817
(d) All Other Steel Plants & Foundries	1,956,853	2,131,096	1,466,875	1,719,709
TOTAL	**4,797,803**	**5,504,000**	**4,239,471**	**4,221,100**
2. Jobbers, Distributors	9,199,811	9,571,436	9,304,817	7,768,068
3. Construction	8,127,889	4,663,774	4,767,703	4,591,098
4. Shipbuilding	2,733,413	2,719,415	283,803	234,794
5. Pressing, Forming & Stamping				
(a) Metal Furniture & Office Equip.	676,944	206,711	237,957	209,958
(b) Hardware & Household Equip.	1,746,810	674,778	563,308	547,277
(c) Automotive	2,587,157	1,611,223	—[2]	—[2]
(d) All Other	1,310,625	1,226,618	596,790	478,583
TOTAL	**6,321,536**	**3,719,330**	**1,398,055**	**1,235,818**
6. Container Industry	4,489,410	4,332,692	4,255,287	3,755,871
7. Agricultural Equipment	1,153,678	1,120,320	1,030,335	904,175
8. Machinery, Tools & Electrical Equip.				
(a) Machinery & Tools	1,569,712	1,607,026	2,415,517	2,344,835
(1) General Industrial Equip.	N.A.	N.A.	970,936	971,929
(2) Construction & Related Equip.	N.A.	N.A.	378,164	273,025
(3) Metalworking Equip.	N.A.	N.A.	188,335	175,446
(4) Tractors	N.A.	N.A.	277,617	347,044
(5) Hand Tools	N.A.	N.A.	212,024	162,403
(6) Other Special Indus. Equip.	N.A.	N.A.	388,441	414,988
(b) Electrical Machinery & Equip.	1,301,275	818,631	1,154,506	1,176,614
(1) Power Generation & Distribution	N.A.	N.A.	791,032	931,962
(2) Other Electrical Apparatus	N.A.	N.A.	239,114	138,068
(3) Communication Equip. & Electronic Devices	N.A.	N.A.	124,360	106,584
TOTAL	**2,870,987**	**2,425,657**	**3,570,023**	**3,521,449**
9. Automotive & Aircraft				
(a) Automotive, excluding tractors				
(1) Passenger Cars	N.A.	N.A.	2,650,981	3,395,906
(2) Trucks	N.A.	N.A.	480,769	452,150
(3) Parts, Accessories & Supplies	N.A.	N.A.	2,980,370	,670,641
(b) Aircraft	N.A.	N.A.	28,465	29,943
TOTAL	**6,392,202**	**2,464,158**	**6,140,585**	**6,548,640**
10. Railroad Industry				
(a) Railroads	3,533,866	3,669,731	709,244	656,383
(b) Equipment & Parts Builders	2,146,935	1,451,466	3,097,502	2,971,000
TOTAL	**5,680,801**	**5,121,197**	**3,806,746**	**3,627,383**
11. Oil, Natural Gas & Mining	1,985,140	1,605,707	526,124	885,348
12. Ordnance, Projectiles & Tanks	1,413,246	5,508,761	30,458	33,213
13. Miscellaneous	1,429,500	4,692,450	6,395,354	6,188,899
14. Exports	5,888,746	3,793,343	3,026,771	3,080,795
GRAND TOTAL	**62,484,162**	**57,242,240**	**48,775,532**	**46,596,651[3]**

[1]Auto only [2]Included in Group 9 [3]First 9 months N.A.—Not Available.

Year-end Estimate = **62,900,000**

SOURCE: AMERICAN IRON & STEEL INSTITUTE

Where Materials Are Going



Gray iron castings and gears have been in heavy demand

WHERE steel went in 1947 is an indication of where it is likely to go. The table on the opposite page tells the story.

The steel industry's expansion program calls for increases of 2.5 million tons in steel ingots, 3 million tons in blast furnace capacity, a like amount in coke-oven facilities, and a considerable gain in flat-rolled steel capacity.

This year, nothing like the jump in production between 1946 and 1947 is possible. Almost 63 million tons of finished steel was produced last year, as against 48 million tons in 1946.

Worst pinch in finished steel will be in the first quarter. From then on, the situation should gradually ease as new capacity comes in.

Sheet and strip mills believe that more tonnage will go to domestic users this year than last, despite heavy export commitments.

The big unknown factor in steel supply is the rate at which steel has been stockpiled the past year. Analysts believe the rate has been high and that it will decline in 1948, releasing substantial tonnages for consumption.

Over-all steel exports are likely to be at a higher rate than the 6.2 million-ton annual rate at which we have been shipping steel lately.

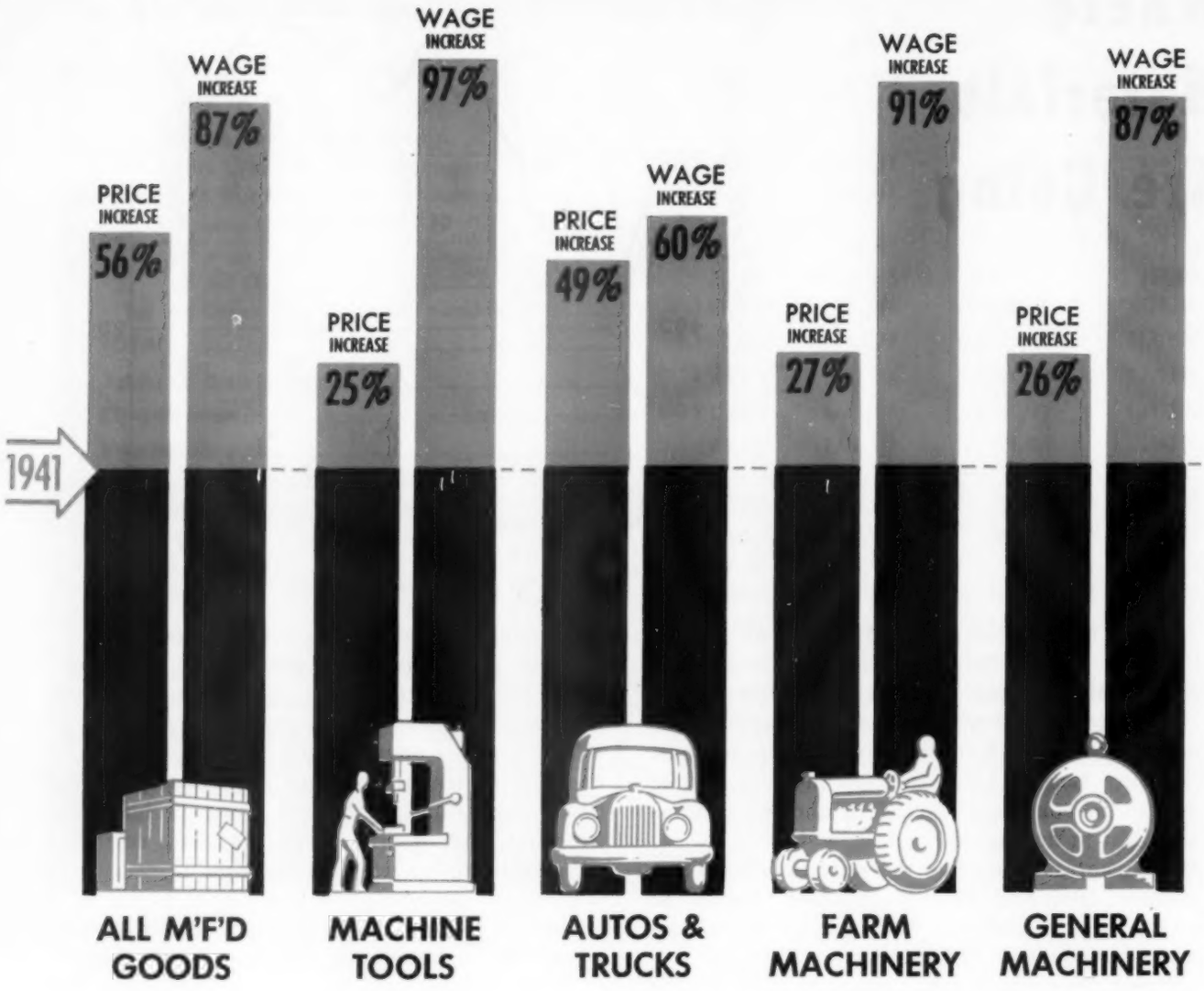
Production of materials other than steel and of components is listed below.

PRODUCTION OF MATERIALS AND COMPONENTS

	1946				1947		
PRODUCT	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.
Pig Iron—Total (Thousands of Tons)	8,151	9,444	14,037	12,997	14,500	14,208	14,055
Merchant	N.A.	204[1]	501	421	496	462	484
Foundry	1,129	1,023	1,277	1,273	1,452	1,431	1,281
Refined Copper (Tons)	139,070	63,410	171,000	230,591	290,291	316,606	274,878
Lead (Tons)	118,033	61,880	110,439	113,551	140,921	152,481	139,248
Slab Zinc (Tons)	197,184	203,172	187,033	255,548	226,657	206,573	241,600
Aluminum (Tons)	73,000	78,550	116,700	142,000	150,079	148,382	138,280
Castings (Short Tons)							
Steel	267,593	398,974	373,665	391,817	399,550	424,080	374,818
Gray Iron	2,119,099	2,425,819	2,750,637	2,974,102	3,177,618	3,232,813	2,889,887
Malleable	144,076	189,258	202,565	216,508	227,228	235,892	198,134
Copper & Copper-base Alloy	122,324	131,843	132,523	146,104	144,436	136,454	119,410
Zinc & Zinc-base Alloy	37,145	47,621	49,321	58,205	61,633	55,759	46,036
Aluminum & Aluminum-base Alloy	38,054	45,882	51,050	59,365	60,360	56,027	48,256
Steel Forgings (Tons)	376,241	497,658	526,539	574,641	600,355	545,005	299,165[2]
Gears (Mo. Avg.—Index, 1935-39 = 100)	248.5	276.2	328.6	337.4	320.9	313.8	279.2

1—May and June only 2—Commercial Steel Forgings only

SOURCES: American Iron & Steel Institute, Copper Institute, American Bureau of Metal Statistics, American Zinc Institute, Inc., Bureau of Mines, Bureau of Census, American Gear Manufacturers Association



Wages Have Increased More Than Prices

INDUSTRIALISTS have long contended that wage increases since 1941 have been greater than price increases. Figures supplied by the Bureau of Labor Statistics and published on the next two pages confirm this fact.

Wage hikes in all manufacturing industries have soared 87%, on an hourly basis, since January, 1941, as shown in the above chart. Prices, by contrast, have gone up 56%.

The same story, in varying degrees, is true of different metalworking industries. The sharpest contrast is in the machine tool industry, where hourly wage rates are up 97% and prices only 25%. Almost as great a disparity is found in the farm machinery field.

Wage and price increases come closest to counterbalancing one another in the automobile industry. But even there the wage advance is 60%, compared with a price boost of 49%.

Hourly wage rates have skyrocketed in certain industries since 1941: 117% in machine-tool accessories (highest of all the metalworking lines), 113% in firearms, 110% in textile machinery, 108% in stamped and enemaled ware, 106% in silverware and plated ware, and 104% in hardware and in tin cans and other tinware.

The smallest increase in hourly rates has been in the automobile industry. But one should keep in mind that the base rate in that industry in January, 1941, was the highest of all the industries reported. Out of 44 listings of industrial groups, only seven have averaged hourly wage boosts of less than 80%.

Average hourly earnings in all manufacturing

WHAT'S HAPPENED TO WAGES

INDUSTRY	AVERAGE WEEKLY EARNINGS					AVERAGE HOURLY EARNINGS				
				Percent Increase					Percent Increase	
	Jan. 1941	Sept. 1946	Sept. 1947	Jan.'41 Sept.'47	Sept.'46 Sept.'47	Jan. 1941	Sept. 1946	Sept. 1947	Jan.'41 Sept.'47	Sept.'46 Sept.'47
ALL MANUFACTURING INDUSTRIES ...	$26.64	$45.41	$50.45	89%	11%	66.9¢	109.2¢	124.9¢	87%	14%
Durable Goods	30.48	48.39	54.05	77	12	72.5	116.5	133.1	84	14
Nondurable Goods	22.75	42.34	46.77	106	10	60.1	101.8	116.5	94	14
Steel Mills	33.60	50.28	59.16	76	11	85.2	130.4	151.5	78	16
Gray-iron and semi-steel castings...	30.45	52.58	57.78	90	10	71.2	118.6	136.8	92	15
Malleable iron castings	28.42	51.50	55.93	97	9	68.6	122.5	139.3	103	14
Steel castings	32.27	49.28	56.50	75	15	75.0	126.4	141.5	89	12
Cast iron pipe and fittings	25.42	43.59	48.34	90	11	60.7	103.9	119.9	98	15
Tin cans and other tinware	25.31	46.22	55.05	118	19	62.3	106.3	126.9	104	19
Wirework.....	28.27	50.30	53.70	90	7	69.5	116.6	132.8	91	14
Cutlery and edge tools	25.90	45.83	49.20	90	7	63.2	101.0	117.1	85	16
Other small tools	29.49	47.59	52.39	74	10	61.9	106.7	124.3	101	16
Hardware	25.24	45.26	50.43	100	11	60.0	105.2	122.2	104	16
Plumbers supplies	27.13	45.63	52.38	93	15	68.2	113.2	131.0	92	16
Stoves, oil burners, etc.	26.07	47.36	53.32	105	13	66.5	114.4	130.5	96	14
Steam & water heating apparatus..	30.98	49.72	54.54	76	10	69.7	117.9	135.2	94	15
Stamped & enameled ware	26.32	45.53	51.72	96	14	65.0	111.6	129.7	108	16
Structural & ornamental metalwork.	31.01	48.71	56.17	81	15	71.2	116.7	134.2	88	15
Bolts, nuts, washers, rivets	29.58	45.67	52.35	77	15	67.6	114.4	131.2	93	15
Forgings, iron & steel	36.75	53.52	62.19	69	16	76.3	133.2	153.4	101	15
Firearms	35.09	53.30	58.51	67	10	65.7	120.1	140.1	113	17
Electrical equipment	33.18	49.41	55.05	66	12	72.3	118.1	136.0	88	15
Radios and phonographs	24.08	43.11	47.24	96	10	62.1	104.0	118.2	90	14
Communication equipment	32.47	50.41	53.45	65	6	75.3	114.2	133.9	78	17
Machinery & machine products	34.00	51.08	56.41	66	10	73.3	119.4	137.0	87	15
Engines & turbines	36.50	55.26	60.82	67	10	77.7	132.3	150.7	95	14
Tractors	36.03	51.21	58.69	63	15	83.4	127.3	144.8	74	14
Farm machinery, excl. tractors	29.92	51.09	57.97	94	13	74.0	123.0	141.7	91	15
Machine tools	40.15	54.31	58.32	45	7	71.6	124.3	141.1	97	14
Machine-tool accessories	37.90	56.28	60.67	60	8	68.2	130.7	147.9	117	13
Textile machinery	30.13	49.43	56.64	88	15	63.4	110.5	132.9	110	20
Typewriters	26.40	47.19	51.91	97	10	66.1	108.6	128.0	94	18
Other business machines	34.78	52.80	63.21	82	20	81.3	130.3	151.3	86	16
Locomotives	34.79	58.12	64.34	85	11	77.3	143.4	156.1	102	9
Railroad cars	29.57	49.08	54.87	86	12	75.4	120.4	137.5	82	14
Air frames and parts	34.13	53.51	54.00	55	1	72.6	127.0	138.4	91	9
Aircraft engines	42.16	56.67	58.71	39	4	82.0	130.2	145.8	78	12
Ships and Boats	37.69	51.70	57.64	53	11	85.5	141.4	146.2	71	3
Automobiles	37.69	53.12	59.74	59	12	95.0	134.8	151.8	60	13
Aluminum	32.85	47.10	49.63	51	5	74.8	116.9	128.9	72	10
Clocks and watches	23.90	43.56	46.87	96	8	60.2	103.5	115.8	92	12
Jewelry	26.43	48.96	50.23	90	3	65.0	106.1	120.2	85	13
Silverware and plated ware	27.37	55.60	61.28	124	10	64.0	112.4	132.1	106	17
Lighting equipment	28.19	46.18	50.23	78	9	70.1	115.2	134.3	92	17

SOURCE: BUREAU OF LABOR STATISTICS

WHAT'S HAPPENED TO PRICES

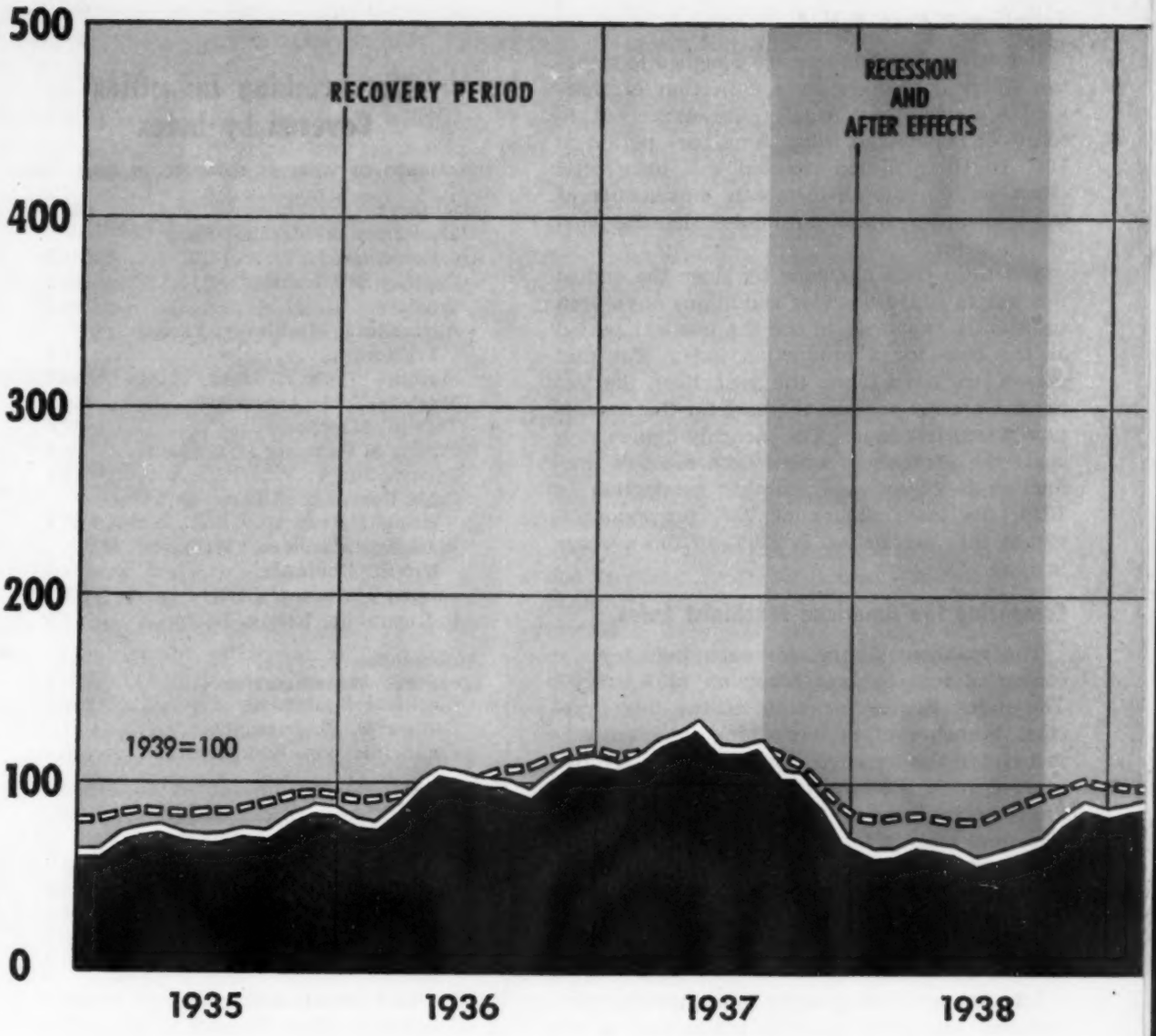
	(INDEX NUMBERS, 1939 = 100)					PERCENT OF INCREASE	
	JAN. 1941	JUNE 1945	JUNE 1946	JAN. 1947	JUNE 1947	JUNE 1946 to JUNE 1947	JAN. 1941 to JUNE 1947
ALL MANUFACTURING PRICES (1926 = 100)	84.3	99.6	105.6	127.6	131.4	24%	56%
COST OF LIVING (1935-39 = 100)	100.8	129.0	133.3	153.3	157.1	18%	56%
STANDARD MACHINE TOOLS	114	118	130	137	143	10%	25%
Boring Mill, vertical	112	117	128	132	146	14%	30%
Drill, radial	123	125	127	142	142	12%	15%
Drill, upright	111	111	118	128	128	8%	15%
Grinding Machine, cylindrical	118	119	134	134	142	6%	20%
Lathe, engine	116	119	132	131	143	8%	23%
Lathe, turret	111	110	128	133	133	4%	20%
Milling Machine	116	117	128	130	135	5%	16%
Planer	116	116	125	144	144	15%	24%
Punch Press	110	122	158	180	186	18%	69%
Screw Machine, automatic	106	117	122	125	126	3%	19%
Horizontal Shaper	121	127	127	138	153	20%	26%
GENERAL MACHINERY & EQUIPMENT	100.9	102.3	110.1	124.1	126.8	15%	26%
Engines	100.1	107.2	120.1	131.7	130.6	9%	30%
Air Compressors	100.2	100.4	100.5	120.8	123.2	23%	23%
Power-driven Pumps	98.5	103.3	105.9	126.4	129.8	23%	33%
Mechanical Instruments	100.7	109.1	123.3	123.9	124.2	1%	23%
Scientific Instruments	100.1	99.8	108.1	119.0	125.3	16%	25%
Materials-Handling Equip.	102.0	103.6	111.4	121.6	123.6	11%	21%
Fans & Blowers	102.7	110.9	110.9	138.8	140.5	27%	37%
Mechanical Stokers	101.7	103.5	114.9	140.5	145.5	27%	43%
Industrial Oil Burners	100.0	103.0	108.6	126.6	126.6	17%	27%
Heat Exchangers	109.0	119.4	128.4	159.7	174.6	36%	60%
Cutting Tools & Machine Tool Attachments	100.0	100.0	114.3	117.3	118.2	3%	18%
Power Transmission Equip.	100.4	97.8	102.8	118.9	122.3	19%	22%
Gas Welding & Cutting Equip.	100.0	100.0	105.2	110.1	113.6	8%	14%
Lubricating Equip.	100.0	99.9	108.1	120.5	118.4	10%	18%
Industrial Scales	100.7	107.6	129.8	135.7	137.7	6%	37%
Heat Treating Furnaces	100.2	101.2	109.8	117.5	118.2	8%	18%
FARM MACHINERY (1926 = 100)	94.0	98.7	108.4	119.0	119.7	10%	27%
CONSTRUCTION MACHINERY	103.2	110.9	121.9	131.6	136.6	12%	32%
AUTOMOBILES & TRUCKS (1926 = 100)	100.3	112.8	—	151.3	149.4	—	49%
IRON & STEEL	95.7	99.1	110.1	123.9	131.4	19%	37%
NONFERROUS METALS	83.6	85.9	99.2	130.5	142.9	44%	71%

SOURCE: BUREAU OF LABOR STATISTICS

industries went up 14% in the year ended last September (taking in the second-round increases). In textile machinery, however, the gain was 20%. It was only 3% in the ships and boat industry.

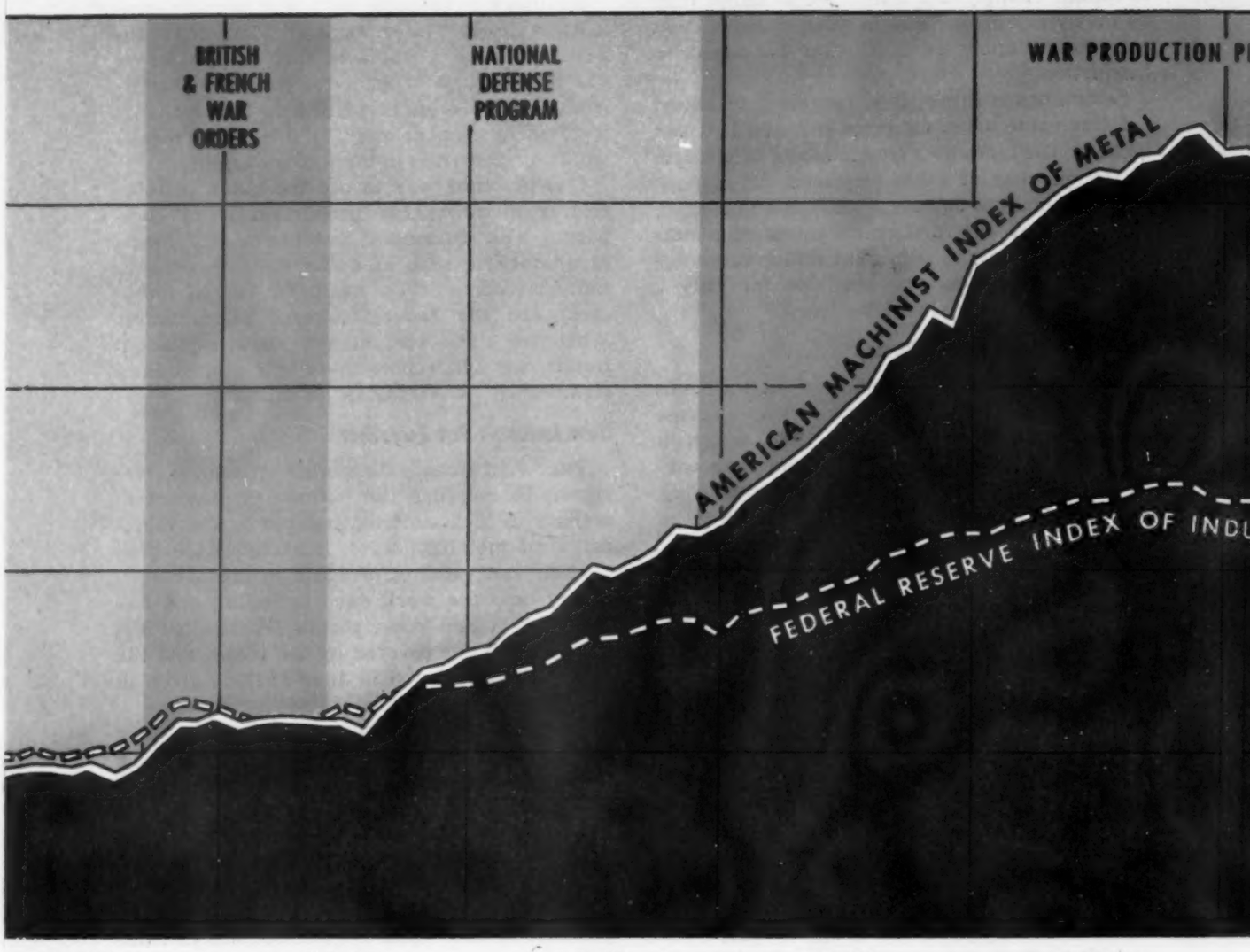
While price increases since 1941 have totaled 56% in all manufacturing lines, the advance has been less than half that (26%) in general machinery and equipment, and only 25% in machine tools.

The smallest increases have been in drilling machines, milling machines, automatic screw machines, cutting tools and machine-tool attachments, gas welding and cutting equipment, and lubricating equipment. Materials-handling equipment has been increased only modestly (21%).



American Machinist

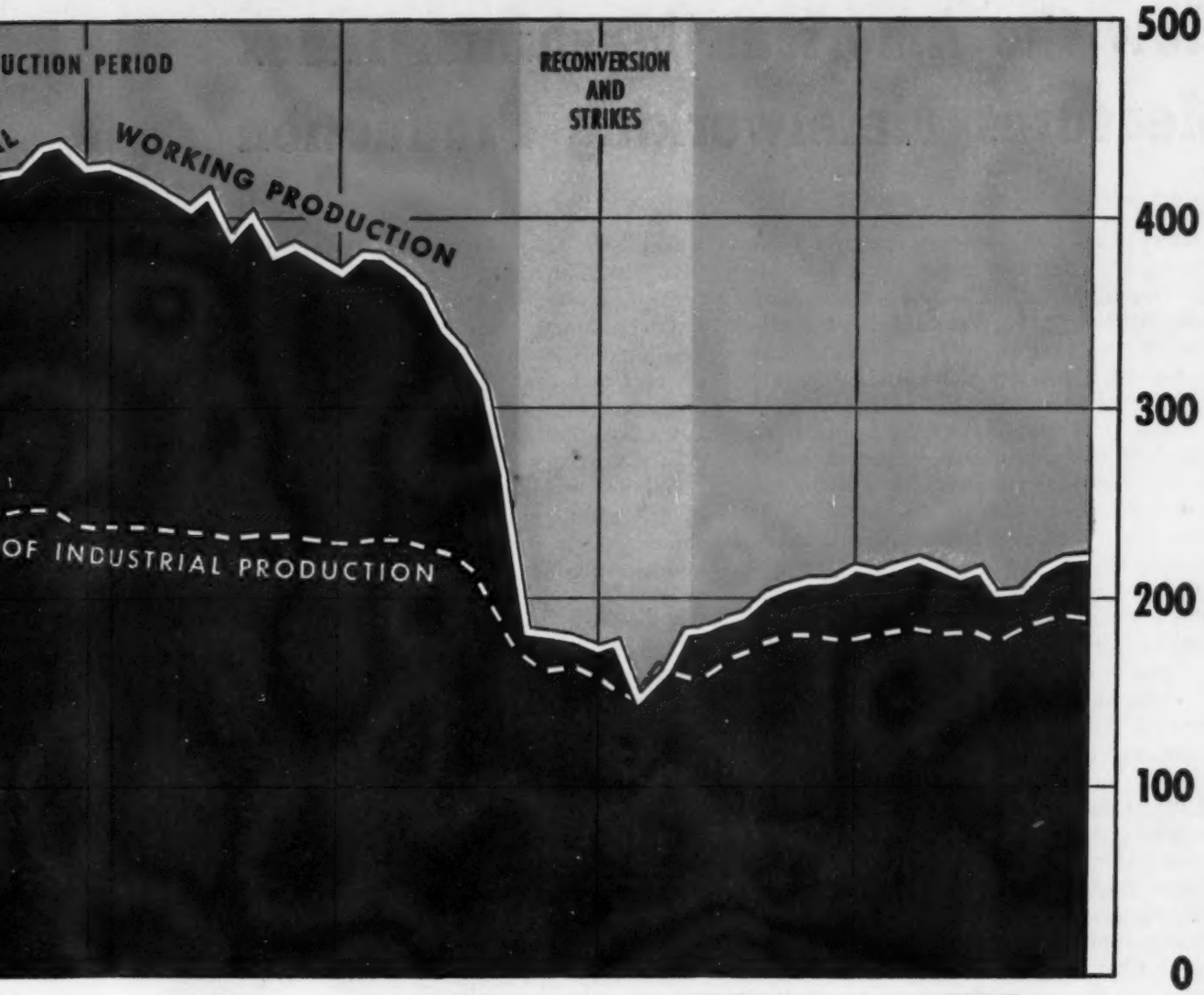
1935		1936		1937		1938	
January	66	January	82	January	110	January	65
February	74	February	81	February	114	February	65
March	77	March	90	March	122	March	67
April	78	April	101	April	128	April	66
May	74	May	106	May	131	May	65
June	73	June	105	June	121	June	61
July	72	July	102	July	120	July	64
August	75	August	101	August	122	August	68
September	74	September	97	September	108	September	72
October	83	October	105	October	105	October	83
November	89	November	112	November	88	November	91
December	88	December	114	December	73	December	89



INDEX OF METALWORI

1939		1940		1941		1942		1943	
anuary	89	January	114	January	158	January	240	January	376
ebruary	92	February	115	February	168	February	249	February	387
March	94	March	118	March	176	March	259	March	397
April	94	April	118	April	179	April	268	April	406
May	93	May	117	May	193	May	278	May	411
une	95	June	118	June	203	June	289	June	417
uly	90	July	113	July	200	July	299	July	416
ugust	94	August	122	August	204	August	315	August	424
eptember	104	September	135	September	213	September	321	September	425
October	114	October	146	October	223	October	341	October	437
November	114	November	149	November	220	November	355	November	440
December	120	December	156	December	227	December	368	December	429

DETAILED EXPLANATION OF INDEX ON OTHER SIDE



Federal Reserve Board Index based on 1935-39=100

ORKING PRODUCTION

	1944	1945	1946	1947
..376	January 430	January 384	January 178	January 216
..387	February 427	February 383	February 150	February 218
..397	March 422	March 375	March 161	March 222
..406	April 415	April 364	April 184	April 219
..411	May 409	May 342	May 185	May 214
..417	June 407	June 331	June 191	June 217
..416	July 392	July 311	July 194	July 206
..424	August 405	August 265	August 204	August 206
..425	September ...384	September ...185	September ...207	September ...216
..437	October 387	October 184	October 211	October 221
..440	November 380	November 181	November 211	November 223
..429	December 385	December 176	December 217	December 226

How the American Machinist Index Measures Metalworking Production

METALWORKING holds a key place in the American scheme of production. Our advantage over other nations is not great in such lines as construction, finance, trade, and woodworking. But we have an overwhelming advantage in making things out of metal. It is largely the products of the metalworking industries—motor cars, refrigerators, washing machines, together with the machines necessary to make these things—that lift our standard of living far above that anywhere else in the world.

Despite metalworking's key position, a satisfactory measuring stick of metalworking activity has never been developed. It is true that both the Federal Reserve system and the Department of Commerce issue monthly figures on durable goods activity. But "durable" goods covers more than metalworking; it includes such diverse factors as steel production, lumber, furniture, glass, building materials, pottery, and rubber products. What is more, the Department of Commerce index is based on dollar figures, thus reflecting changes in prices as well as in production.

The new AMERICAN MACHINIST Index measures only metalworking production. For the first time, businessmen in metalworking lines have a gage of total metalworking activity, plus a measure of production in its principal branches. Every metalworking executive now can compare the progress of his own business with total metalworking output and with total production in his general line. By following the trends in the AMERICAN MACHINST Index, each businessman can be forewarned of changes in his own business. In this way, the AMERICAN MACHINIST Metalworking Index is a new tool for business planning.

Metalworking Hard to Measure

It is simple to measure production in some industries. Take steel. All you have to do is to tally the tonnage of ingots poured each week. In the case of bituminous coal, you simply get a report of the tonnage of coal moving away from the pits.

But it is far more difficult to measure total production of metalworking plants. Metalworking includes a host of diverse products. They range from delicate scientific measuring instruments, through motor cars and machine tools, to big electric turbines and huge units of earth-moving equipment. When the War Production Board set out to collect figures on metalworking, its report was broken down into more than 300 groups.

Because metalworking includes so many different products, there is no simple common denominator like tonnage, which works so well in steel and coal. For this reason, one of the biggest problems in developing a metalworking index is to find a way to add up production in all the branches of metalworking.

Another major problem is to avoid duplication. A simple example: if you should add the value of gear production to the value of automobile production, you would overstate total output. The reason is that some gear manufacturers supply gears to auto companies.

To solve these (and other) tricky problems, the editors of AMERICAN MACHINIST, with the assistance of the McGraw-Hill Department of Economics, have been hard at work for nine months exploring and testing methods of measuring metalworking production.

Three Ways to Measure Output

There are three possible ways to measure metalworking production: (1) physical output (tons, cubic feet, or units), (2) dollar value of shipments, and (3) manhours worked.

AMERICAN MACHINIST first tried to develop an index based on physical output. After thorough study, we concluded that it was impossible to put together this kind of an index. There is not enough information available. A check of government agencies and 150 trade associations showed that less than 10% of metalworking production, outside of the automotive field, is reported regularly in physical volume terms. That is too small a sample to make a good index.

Even if an index based on physical units of production could be developed, it would have two drawbacks. First, it would tend to lag behind, rather than forecast, changes in metalworking activity. Shipbuilding is a good example. Work is spread over several months in advance of actual ship launchings.

Second, an index based on pounds or units does not take account of changes in quality. This point is not important in measuring changes from one month to another; but it can be of major significance over a period of years.

We also studied and rejected the use of dollar value shipments figures as a measure of metalworking production, mainly because they are affected by price changes. A month-

to-month change in a dollar value index may be partly or entirely due to price changes. You may never know exactly what happened to production.

Sometimes it is possible, however, to adjust a dollar value index for price changes. If it can be done, the index is a true measure of changes in the quantity of goods produced. After careful investigation, however, we found that there is not enough information on prices of metalworking products to adjust the dollar value figures. Price indexes are available for only a handful of the metalworking items.

Manhours Chosen as Basis

Manhours was finally selected as the basis of the AMERICAN MACHINIST Index. Because of the accuracy of the data from which it is compiled and because of the complete coverage of the many segments of metalworking, such an index is superior to other methods of measuring metalworking production.

The Bureau of Labor Statistics collects monthly figures on employment and hours worked from a large representative sample of manufacturing plants, including all metalworking lines. These figures are expanded to give an estimate of total employment in each line. The formula used is checked periodically against the records of the Social Security Board.

Changes in output per manhour are the only important source of error for which proper adjustment should be made. Though there are no monthly measures of productivity in metalworking plants, annual measures go back almost 30 years. Moreover, the Bureau of Labor Statistics has set up a new program which will provide better measures of productivity in metalworking plants than have been available heretofore (AMERICAN MACHINIST, June 19, 1947, p. 166-169). So there exist reasonably accurate annual measurements of productivity on which to base adjustments in monthly manhour figures.

The error involved in the monthly figures thus should be very small. In the 20 years before the war, the average increase in productivity was less than 3% per year. That works out to ¼% per month on the average. So the monthly adjustment for productivity would have to be off by 400% to affect the index as much as 1%. With annual figures on productivity to go by, the adjustment should not be anywhere near that much.

A man-hour index has the advantage of being the most sensitive of all measures of production. It increases or decreases the instant a change in production is put into effect, whereas shipments may not change for some time. In machine tools, for example, the manhour index runs a month ahead of the shipments index. When the man-hour index turns down, shipments will fall off a month later.

An index is valuable only if it is useful and if it is used. The AMERICAN MACHINIST Index should be a valuable tool in two ways: (1) it will show what is happening to metalworking production and will help forecast what is going to happen; and (2) it will aid metalworking executives in their own planning.

One practical way to use the index in forecasting metalworking production is to compare it with movements in other measurements of production, such as dollar value shipments, unit shipments when available (as in motor cars) and the Federal Reserve Board index. Whenever these comparisons show significant trends, we will report them and discuss their significance in AMERICAN MACHINIST.

How Index Is Put Together

THE AMERICAN MACHINIST Index is designed to measure the volume of production activity in all industries engaged in the fabrication of metal products. It excludes the production and refining of basic metals, foundry output, and the work done in rolling and finishing steel and other metals. A detailed list of the industries covered by the index, and the employment reported in June 1947, is given in the accompanying table.

Each month the Bureau of Labor Statistics releases figures on employment and average weekly hours worked in the industries covered. Multiplying these two factors gives a measure of the manhours worked in each industry.

In the task of combining output of various metalworking industries into a single index, allowance should be made for the relative importance of each industry. Statisticians call this procedure "weighting." Production of 1,000 automobiles should be given more weight in a metalworking index than production of 1,000 electric toasters.

After examining several methods of "weighting," it was found that the most accurate results were obtained by using manhours worked as a measure of the relative importance of each industry. The postwar pattern of metalworking production differs so radically from the prewar pattern that the use of prewar weights would throw the index out of line. This difficulty is avoided by employing manhours worked as weights. The weights thus change in proportion as each industry's relative importance to metalworking as a whole changes.

Here is how the major branches of metalworking stack up in the postwar period under this method of weighting:

	PERCENT OF METALWORKING TOTAL
Machinery	32.5
Autos & Trucks	22.6
Electrical Manufacturing	15.4
Transportation Equipment	12.4
All Other Metalworking	17.1

Selecting A Base Period

Because index numbers are designed to measure average changes in a collection of individual series, they usually are expressed in terms of percentage using some base period as 100. The base period selected will have little effect on the month-to-month movements of the total index, but it does determine the level of the index.

Too little time has gone by since the end of the war to judge whether conditions have been sufficiently "normal" to use the postwar period as the base for a production index. For that reason, we have taken the year 1939, the last normal prewar year, as the base for the AMERICAN MACHINIST Index. The monthly figures thus show the percentage which each month's production is of average monthly production in 1939. An index figure of 220, for example, means that production is 220% of the average in 1939.

Computing the American Machinist Index

The manhour figures for each industry are converted into indexes based on 1939 as 100. The index figures for each of the five principal branches of metalworking then are adjusted for the average change in productivity derived from the long-term productivity trend as shown by Bureau of Labor Statistics reports. The final step is to add together the separate indexes to arrive at the total Index of Metalworking Production, which is reproduced on the other side of this sheet.

Possible Adjustments

THE AMERICAN MACHINIST Index, unlike many measures of total industrial production, is not adjusted either for seasonal variations or for the long-term trend. Because of the huge backed-up demand for most metal products, metalworking production has not settled down into any sort of a seasonal pattern. As soon as such a seasonal pattern becomes important, we will work out a seasonal adjustment for the Index figure.

Adjustments for the long-term trend are introduced in many indexes in an attempt to get a sharper picture of the changes resulting from the business cycle. Sometimes such adjustments make the resulting index misleading. Statistically, it is next to impossible to compute a "normal" growth rate on which to base the adjustment. Even more important is the logical objection that such an adjustment, even if it could be made successfully, would remove one of the principal factors influencing metalworking production. It also removes the principal element that accounts for the changing importance of different industries. For these reasons, the AMERICAN MACHINIST Index is not adjusted for the long-term trend.

Metalworking Industries Covered by Index

(THOUSANDS OF WORKERS EMPLOYED IN JUNE, 1947)

Machinery	888.8
Machinery & Machine Shop Products	381.8
Engines & Turbines	43.1
Tractors	56.4
Agricultural Machinery, Excluding Tractors	51.4
Machine Tools	53.4
Machine-Tool Accessories	44.9
Textile Machinery	38.6
Pumps & Pumping Equipment	58.6
Typewriters	18.1
Cash Registers, Adding & Calculating Machines	37.7
Washing Machines, Wringers & Driers, Domestic	14.8
Sewing Machines, (All)	11.7
Refrigerators, Refrig. Equip.	78.3
Automobiles	789.
Electrical Manufacturing	477.4
Electrical Equipment	314.7
Radios & Phonographs	81.8
Communication Equipment	80.9
Transportation Equipment	394.2
Locomotives	24.3
Cars, Electric—and Steam—Railroad	54.9
Aircraft & Parts (Not Engines)	133.9
Aircraft Engines	26.9
Shipbuilding & Boatbuilding	140.9
Motorcycles, Bicycles & Parts	13.3
All Other Metalworking	603.9
Tincans & Other Tinware	42.4
Cutlery & Edge Tools	23.3
Tools (Except Edge Tools, Machine Tools, Files & Saws)	25.2
Hardware	49.5
Plumbers' Supplies	29.2
Stoves, Oil Burners & Other Heating Equipment	62.8
Steam Fittings	48.1
Stamped & Enameled Ware & Galvanizing	82.7
Fabricated Structural Steel & Ornamental Metalwork	58.7
Metal Doors, Sash, Frames, Molding & Trim	9.3
Bolts, Nuts, Washers & Rivets	21.2
Wrought Pipe, Welded & Heavy Riveted	12.7
Screw-mach. Prods., Wood Screws	27.7
Steel Barrels, Kegs & Drums	6.1
Firearms	14.2
Clocks & Watches	27.3
Jewelry	16.5
Silverware & Plate Ware	15.9
Lighting Equipment	31.1

DATA: Bureau of Labor Statistics

AMERICAN MACHINIST

35th

ANNUAL REVIEW

of

Metalworking Equipment

PARTS AND MATERIALS

More than 1500 new products of interest to the metalworking industries are included in this concise, classified review. These items, describing equipment introduced during the past year, set a record for number and include more of the new machine tools shown at the 1947 Machine Tool Show than any previous single issue. These products are available now to help meet the production problems of 1948

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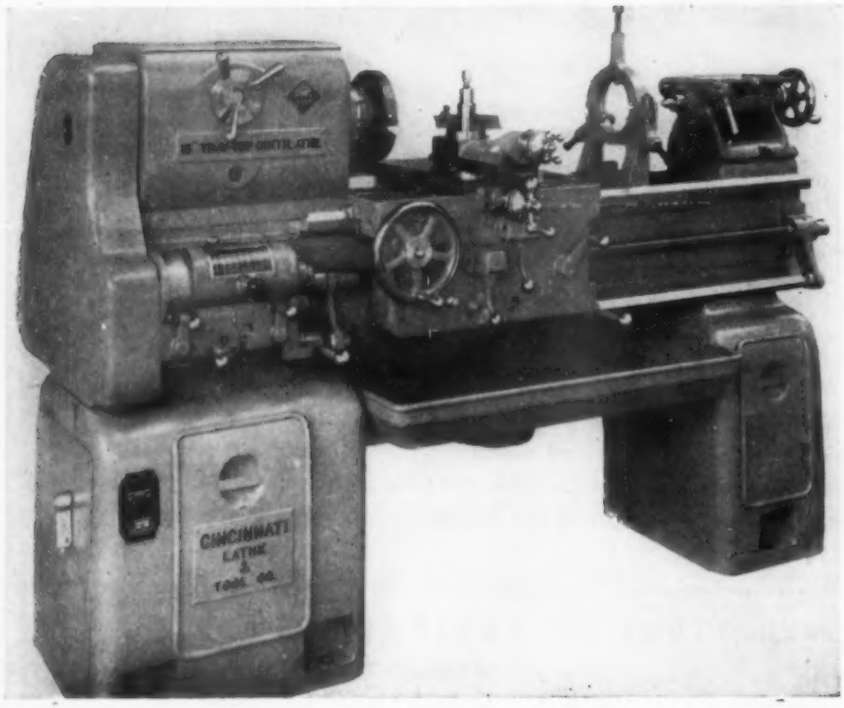
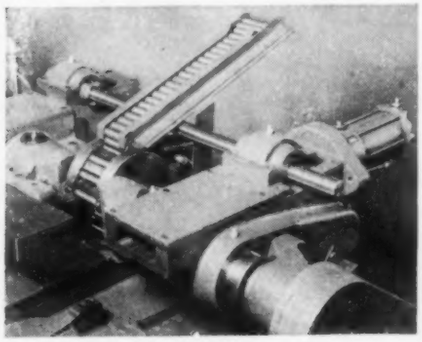
AMERICAN MACHINIST 35th ANNUAL REVIEW

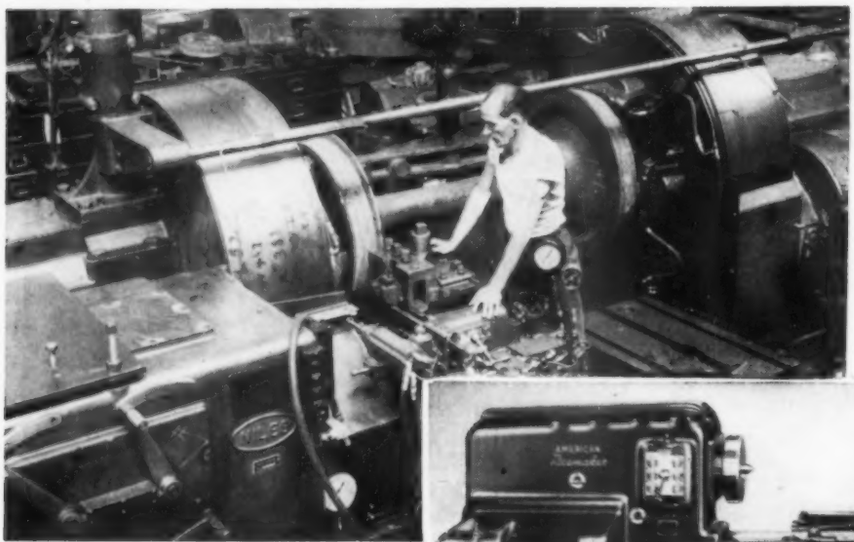
Turning



ENGINE LATHES—*Cincinnati Lathe & Tool Co., Oakley, Cincinnati 9, Ohio.* A series of light motor-driven geared-head engine lathes, "Tray-Top" Cintilathes, is offered in four nominal swing sizes, 10, 12½, 15 and 18 in. with distances between centers from 18 in. up in increments of 6 in. Twelve spindle speeds are available in standard and high-speed ranges. A range of 48 threads and feeds is included. ←

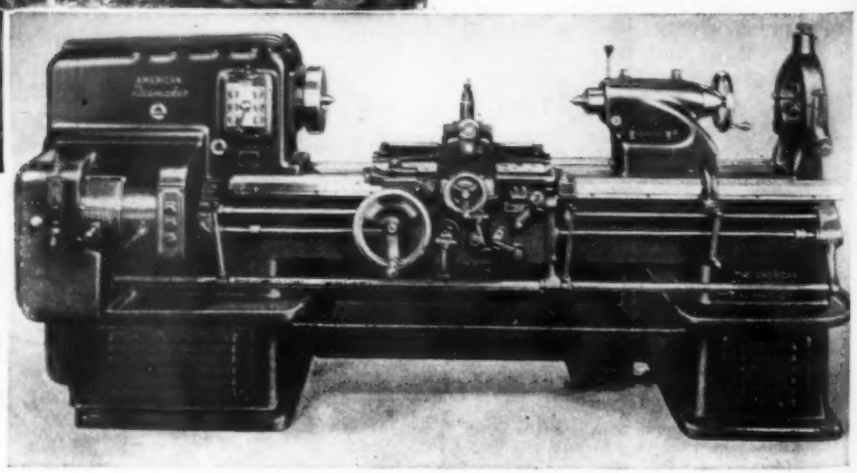


WORK-LOADING—*Seneca Falls Machine Co., Seneca Falls, N. Y.* Loaders are for single machines or a battery of machines. In device illustrated, valve guides are placed in loading chutes and fed by gravity into the rotary loader.

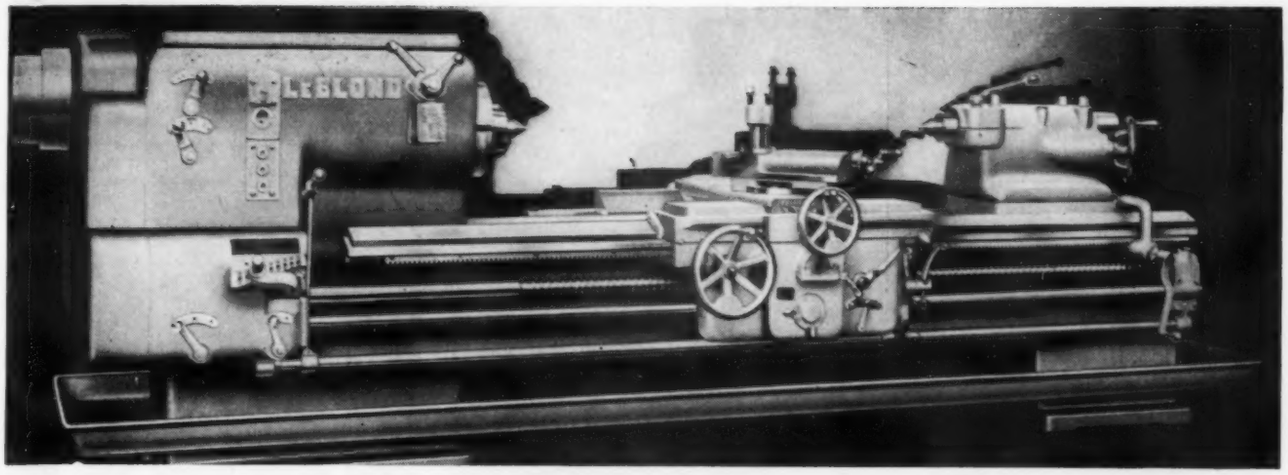


CONTOURMATIC — *Cincinnati Lathe & Tool Co., Oakley, Cincinnati 9, Ohio.* The Contourmatic is a standard engine lathe with a simplified hydraulic tracing attachment which synchronizes in and out movements of the cross-slide with the longitudinal movement of the carriage. The master templet does not rotate and may be a turned workpiece or a flat templet.

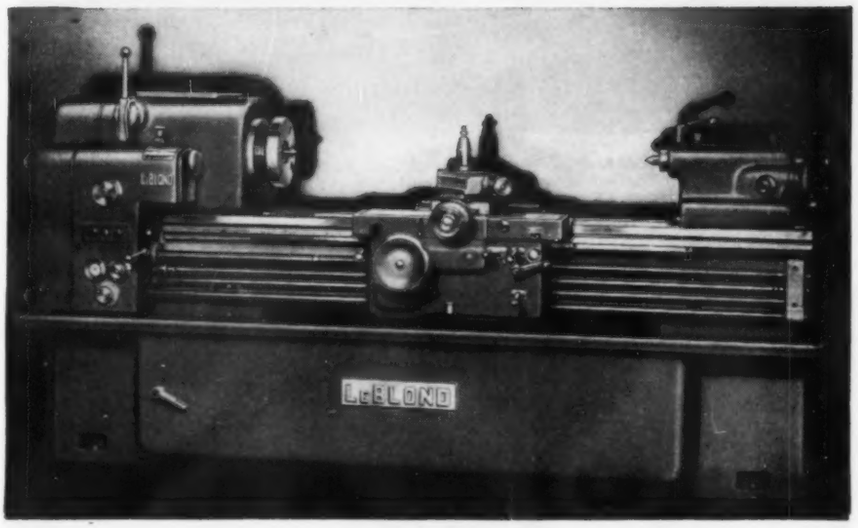
LATHE—*American Tool Works Co., Cincinnati 2, Ohio.* 18-in. Pacemaker lathe, basically designed in standard or precision toolroom models. It has an option of three speed ranges providing 18 or 27 spindle speeds. ↓



LATHE—*Niles Tool Works Co., Div. Lima-Hamilton Corp., Hamilton, Ohio.* Line of car-wheel lathes incorporates new method to machine the tread of mounted steel wheels. Two hydraulic profiling attachments replace conventional four-turret-type forming-tool method. Depth of cut is to ¾ in. and feed is up to 1 in. per min.

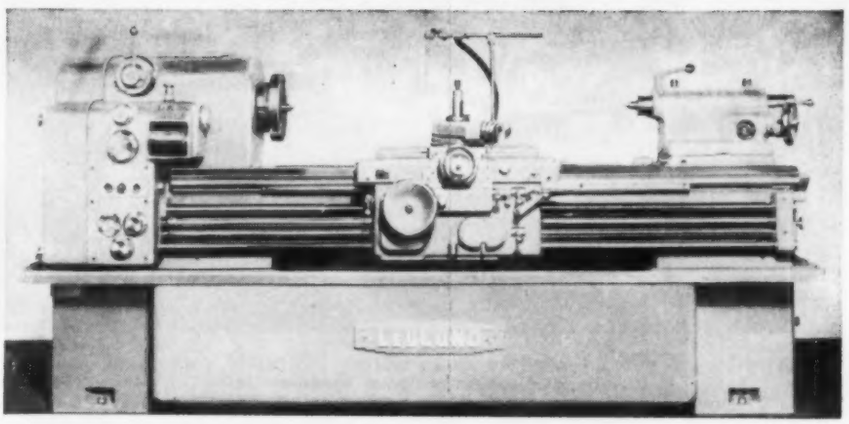


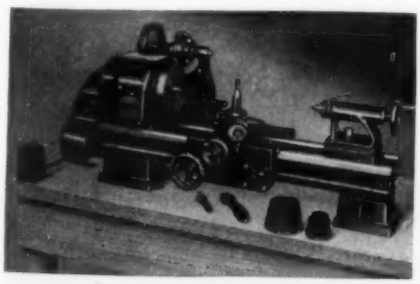
LATHE—*R. K. LeBlond Machine Tool Co., Hyde Park, Cincinnati 8, Ohio.* A 25-in. heavy-duty engine lathe has a totally inclosed, automatically lubricated quick-change box. The lathe has 16-speed geared headstock, one-piece apron, thrust-lock tailstock and 48 feeds and threads.



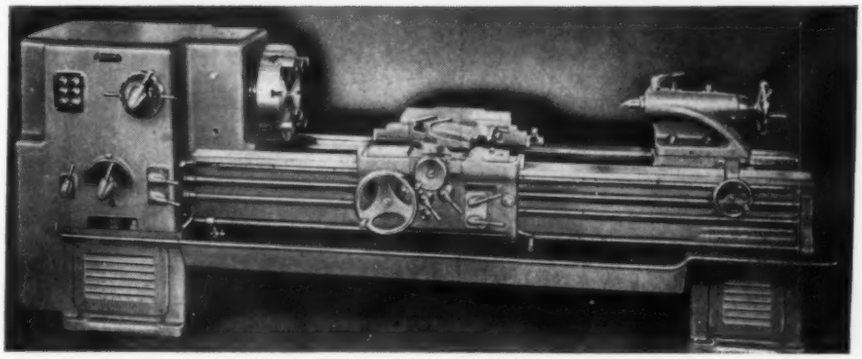
HEAVY-DUTY LATHE—*R. K. LeBlond Machine Tool Co., Hyde Park, Cincinnati 8, Ohio.* 16-in. model RT heavy-duty lathe (illustrated) has single-lever control head. A second version has variable-speed headstock, universal quick-change box, and combined feed apron is also in production. Single-lever control head offers 16 spindle speeds, many in the carbide range. The quick-change box provides 60 changes of feeds and threads without change of gears. →

LATHE—*R. K. LeBlond Machine Tool Co., Dept. AM, Cincinnati 8, Ohio.* 16-in. Model RT toolroom lathe has speed adjuster which controls over 300 speeds from 6 to 1500 rpm. More than 100 speeds can be obtained in each of three ranges provided by the combination gear-belt drive headstock without stopping spindle rotation. →

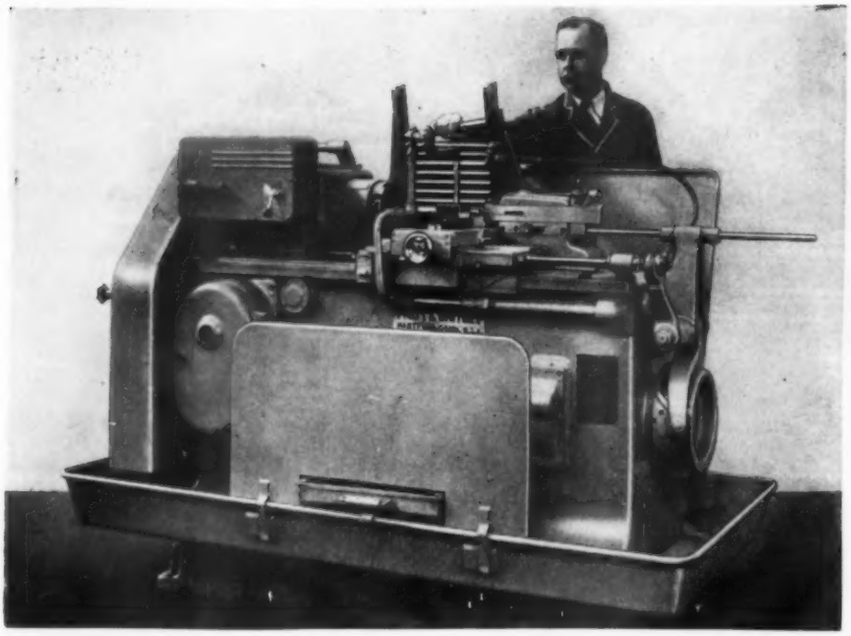




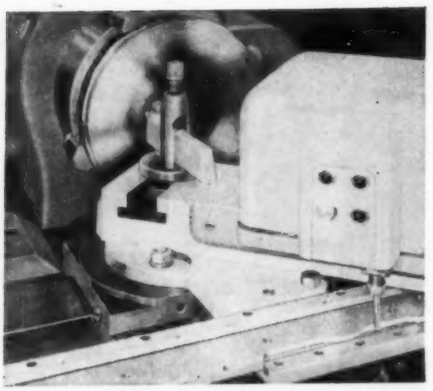
LATHE—*Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill.* A 9-in. lathe with 9-in swing and 18-in. between centers, has same design features as larger models.



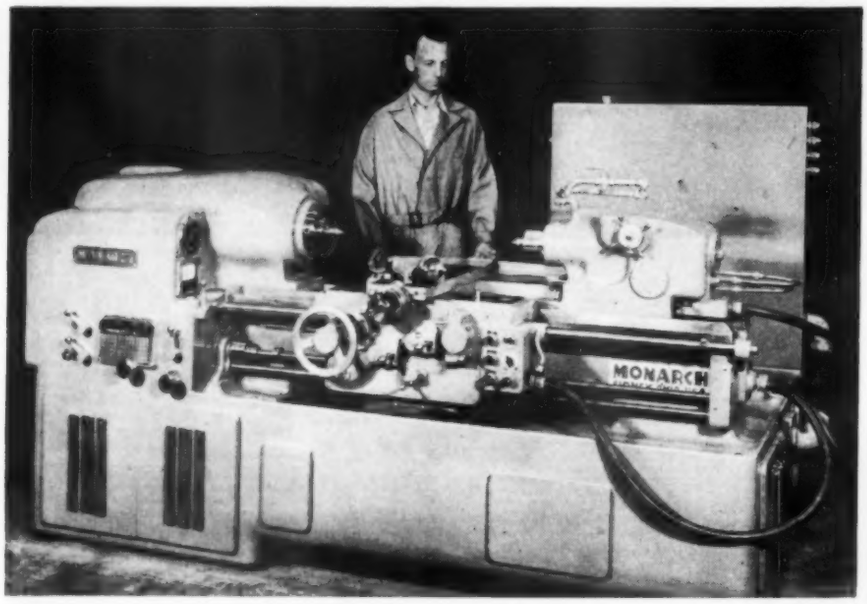
LATHE—*The Sidney Machine Tool Co., Sidney, Ohio.* 18-in. engine lathe is equipped with an all-herringbone-geared headstock with 32 preselective spindle speeds. Standard spindle bore is 1-13/16 in. and can be increased to 3¼ in. Standard speed range of from 13 to 1000 rpm. or optional high range from 10 to 1500 rpm. is available. →



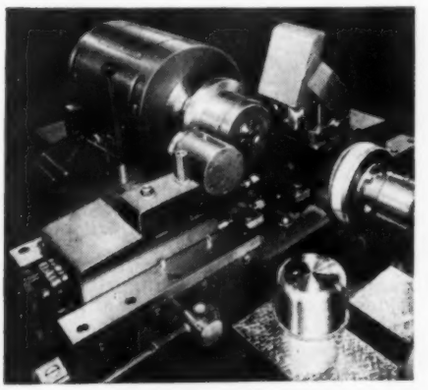
LATHE—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Model "C" Full-Automatic lathe turns work which can only be turned on centers. Work that cannot be fed through a hollow spindle, cut from a bar or held in chucking machines can be turned on unit if it lends itself to stacking in a magazine. Unit handles work from ½- to 1⅜-in. dia. and from 2½ to 18 in. long.



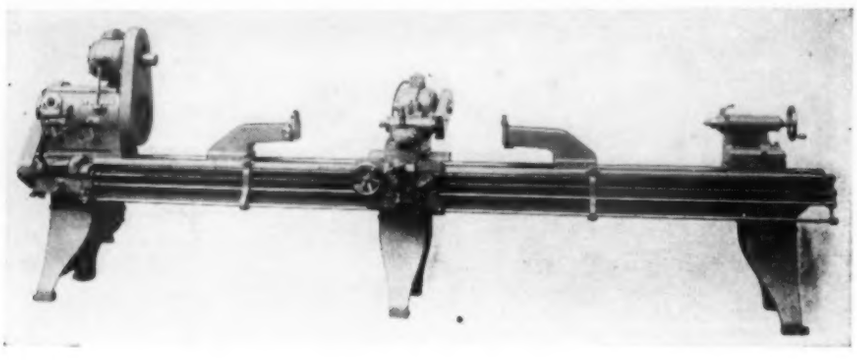
CONTOURING DEVICE—*R. K. LeBlond Machine Tool Co., Dept. AM, Cincinnati 8, Ohio.* Automatic electric contouring device which can be installed on any LeBlond Regal lathe by plugging into nearest light socket, is said to perform, within 0.0015 to 0.002 in., a range of duplicating operations such as straight facing and turning, and tapers of any kind.



LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* The 13-in. Toolmaker's lathe features rapid longitudinal and cross traverse controlled from the apron, hydraulic control of tailstock and spindle clamping, and provision for constant surface cutting speed. Top speed range is 250 to 2000 rpm.

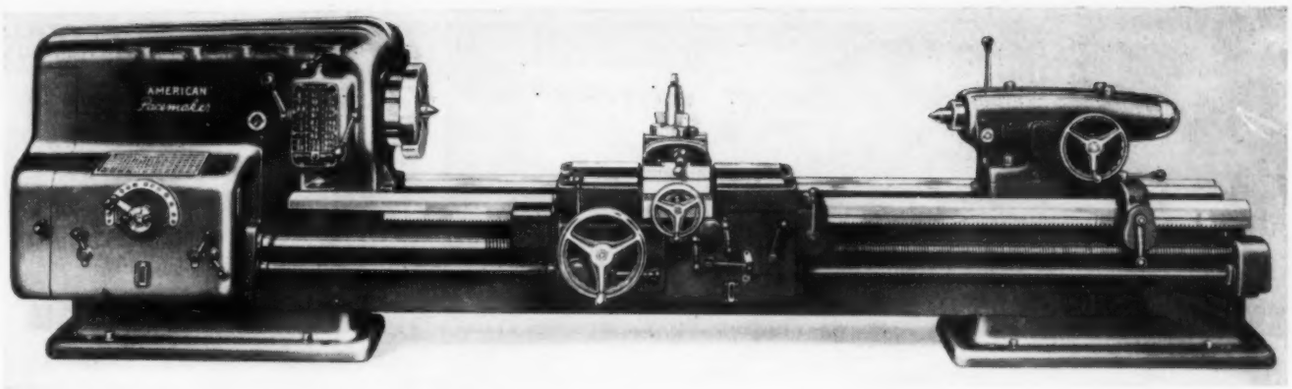


SPINNING-LATHE CROSS-SLIDE—*E. W. Bliss Co., 450 Amsterdam, Detroit 2, Mich.* Independently operated hydraulic cross-slide attachment for second-operation spinning lathes has automatic cycle with pushbutton starter. Timing permits attachments to automatically move in on and retreat from part.

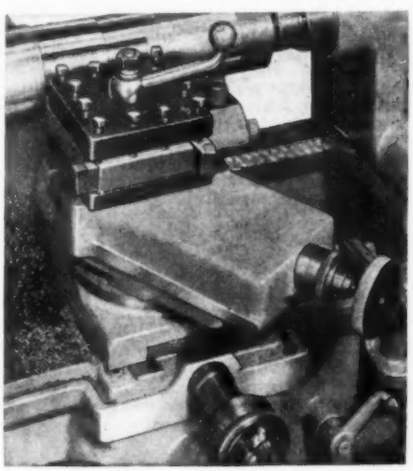


ATTACHMENT — *Monarch Machine Tool Co., Sidney, Ohio.* Unit provides constant surface cutting speed over range of diameters from 2½ to 10 in. for 18-in. Model 60 Toolmaker's lathe. A 5-hp. dc. motor is incorporated.

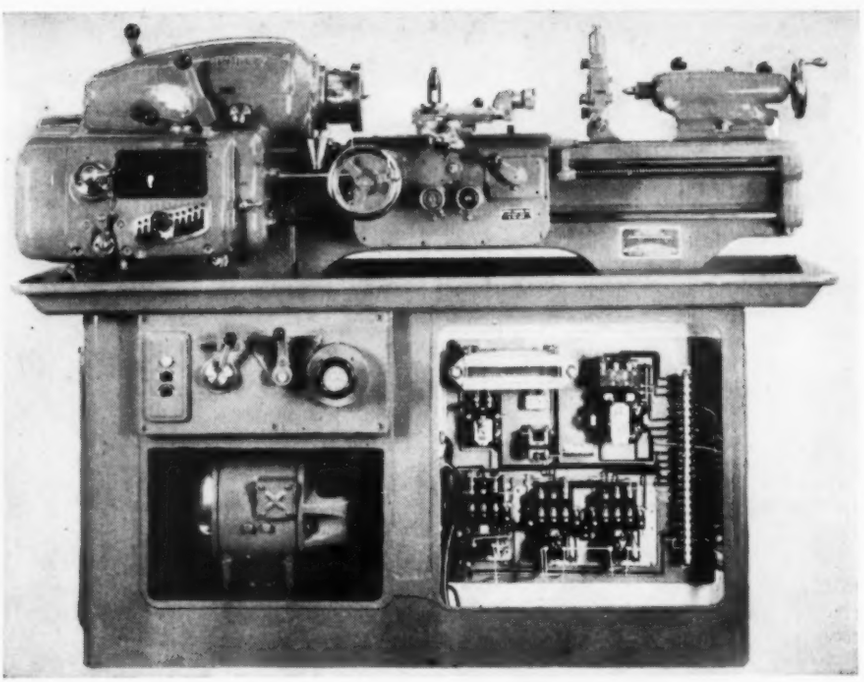
LATHE—*R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* Two-purpose lathe which polishes rubber printing rollers on a production basis, as well as performing standard engine-lathe metal turning, is known as the Regal rubber roller polishing machine. Available in six swing sizes 13 to 24 in.



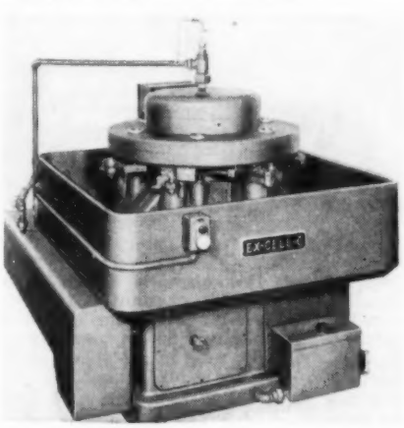
LATHE—*American Tool Works Co., Cincinnati 2, Ohio.* The 25-in. Pacemaker lathe has pushbutton start, stop and brake from the apron. A jog button on the head facilitates changing speeds. Three heads available have speed ranges as follows: 27 speed, 6 to 600 rpm.; 18 speed, 7 to 600 rpm.; 9 speed, 6 to 750 rpm.



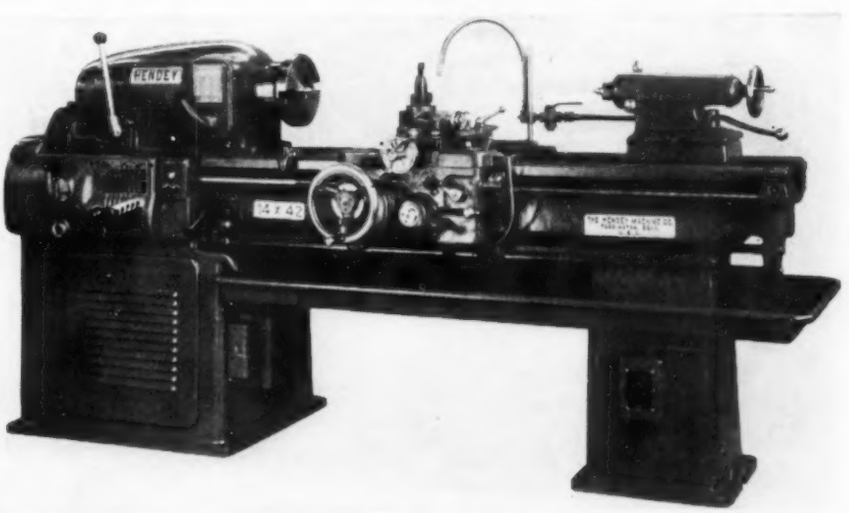
TOOLPOST TURRET—*Enco Mfg. Co., 4522 W. Fullerton Ave., Chicago 39, Ill.* The Model L-4½ toolpost turret uses carbide-tipped tools supported by the flat base. Max. tool size is ⅝x1 in. The unit has 12 stations with 30° indexing, providing three different working positions for each tool.



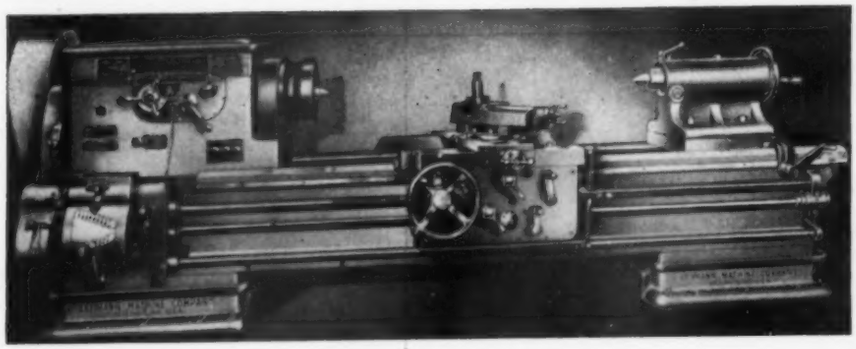
LATHE—*Hendey Machine Co., Torrington, Conn.* The 9x24 in. tool- and gagemakers lathe has a 1⅛ in. maximum capacity. There are stepless spindle speeds from 40 to 2,000 rpm., forward and reverse. The quick-change gear box gives 66 different feeds and 66 different threads without changing any gear for either belt or gear drive.



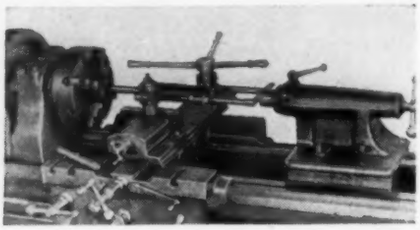
VALVE-STEM MACHINE—*Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Automotive valve stems are grooved and chamfered at a net production rate of 1520 pieces per hour in this special machine. Six collet chucks are arranged on a continuously rotating table with toolholders on the under side.

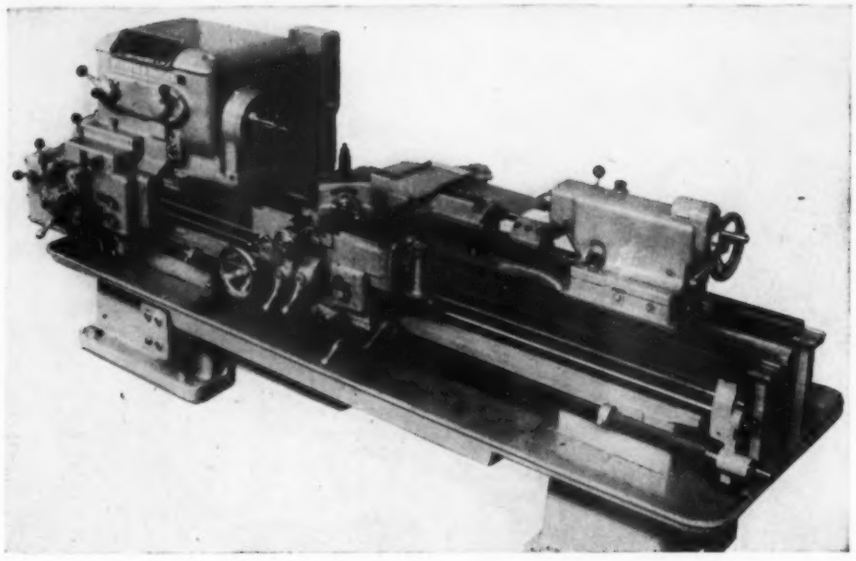


BELT-DRIVEN LATHE—*Hendey Machine Co., Torrington, Conn.* A completely new belt-driven lathe, the No. 2, 14-in. lathe is designed for general-purpose, light-duty work. It has a remote-controlled, belt-shifting arrangement. Change gears provide 48 thread and feed changes, ranging from 1½ to 92 tpi., and from 0.0027 to 0.1663 in. feed per rev.



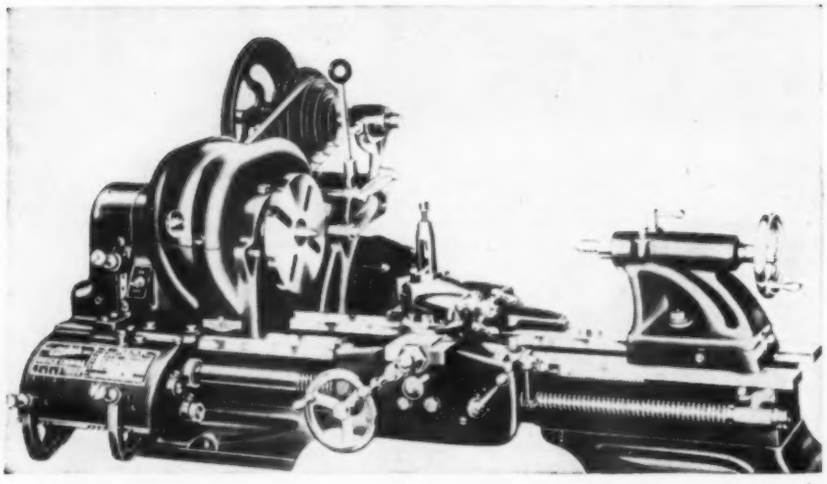
LATHES — *Lehmann Machine Co., Chouteau and Grand Blvd., St. Louis 3, Mo.* Electronic-Hydratrol lathes are made in 16-, 18-, and 30-in. sizes. Also the front carriage is designed to facilitate loading and unloading of the work.



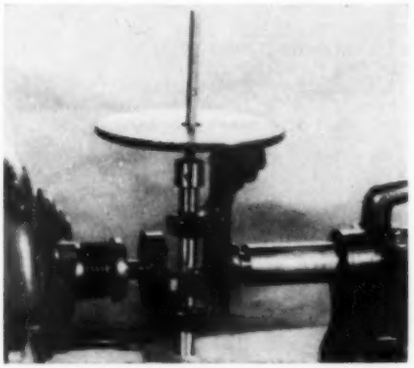


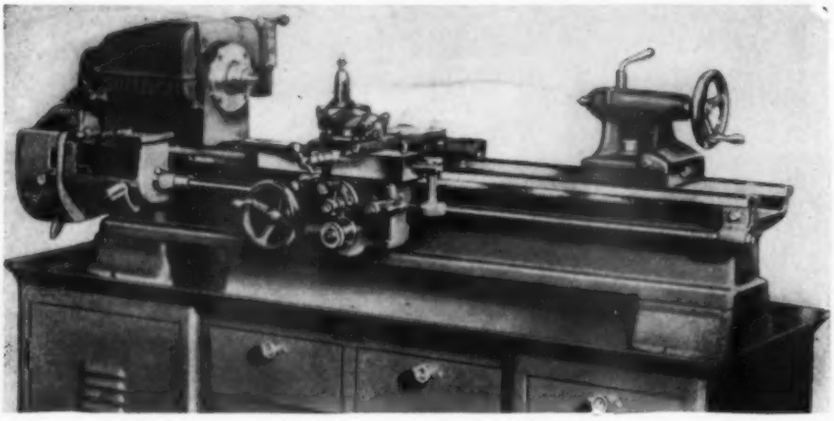
KEYSEATING UNIT—*McNaughton & Co., 608 Sevier Ave., Knoxville 15, Tenn.* Hand-operated keyseating attachment for lathes is used for cutting keyways. Lever-operated movement of a rack-tooth driven spindle provides means to power cutting tool. Spindle has No. 4 Morse taper hole.

LATHES—*Lodge & Shipley Co., Cincinnati 25, Ohio.* Two new models in the Model X lines of lathes extend it to smaller sizes. The 14 and 16-in. engine, toolmakers, and manufacturing lathes have a 24-speed headstock available in three ranges of spindle speeds, new bed and carriage ways, totally inclosed quick change gear box with fingertip dial operation, and automatic lubrication.



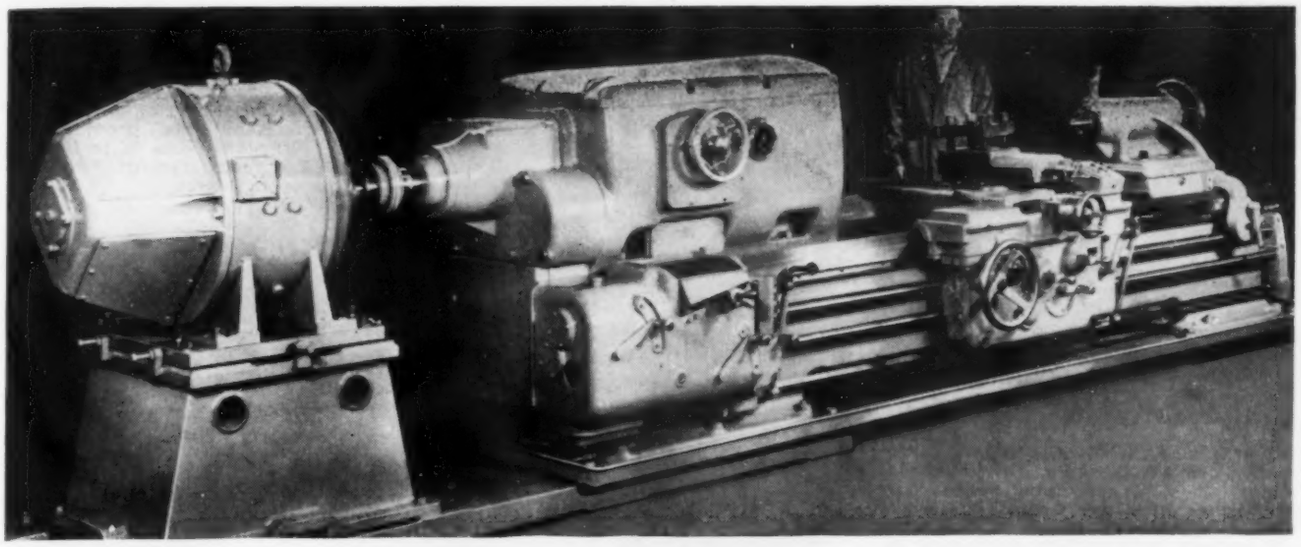
LATHE—*Atlas Press Co., 2304 N. Pitcher St., Kalamazoo 13D, Mich.* A 10-in. quick-change lathe provides fingertip selection of 54 threads and feeds. There are 16 spindle speeds from 28 to 2072 rpm. Thread-cutting range, right and left, is 4 to 240 per in. Two bed lengths are available with 24- and 36-in. capacity.



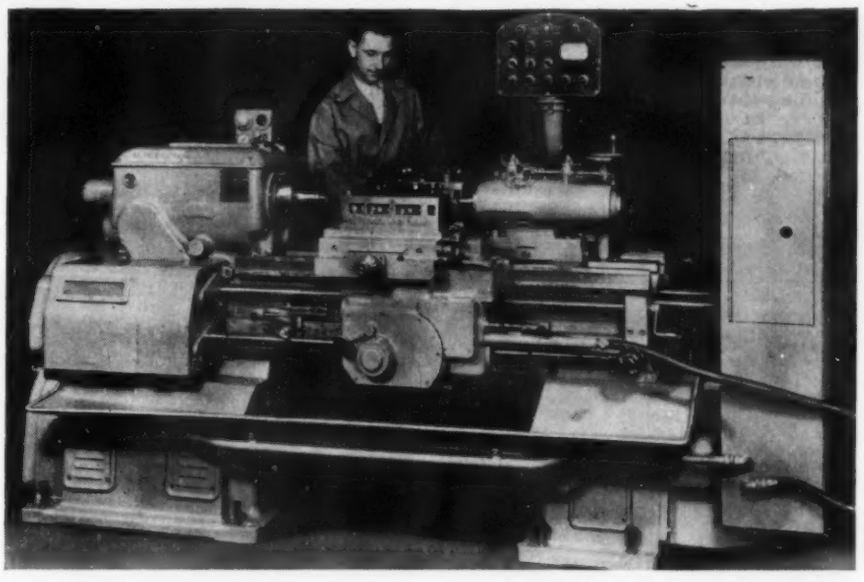


FILING UNIT—*Carey-Anslinger Mfg. Co., 1129 E. Bourbonnais St., Kankakee, Ill.* A filing attachment is for any bench- or floor-model lathe. Driving mechanism is chucked in headstock. It will drive at any lathe speed, give ⅞-in. stroke, run in any position, and take ¼-in. round-shank machine files.

LATHE—*Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, Ill.* TRB S-56 lathe has headstock redesigned to accommodate large zero-inspection bearings, eliminating bearing caps and changing to larger solid housing. Lathe has 11¼-in. swing, 1-in. collet capacity, is 35 in. between centers, 4-speed V-belt drive.

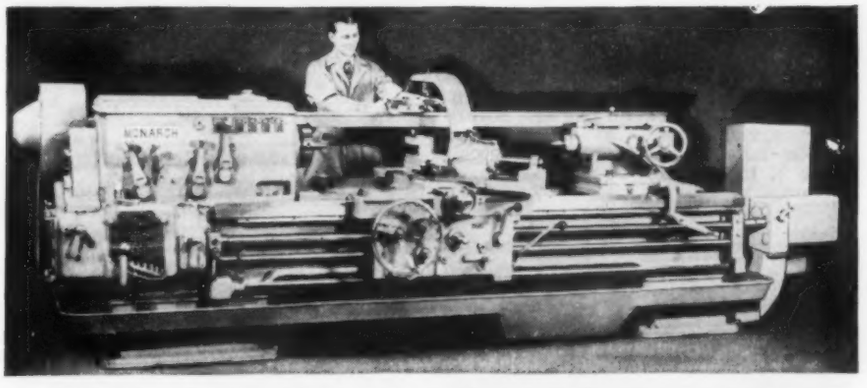


LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* 32-in. Model 150 engine lathe is said to provide more than average swing. Hogs stock from large diameter work. Seven speed ranges with speeds of 9 to 1200 rpm. are provided. 48 feeds range from 0.006 to 0.363 in. Machine is available from 60 to 276 in. between centers in increments of 24 in.

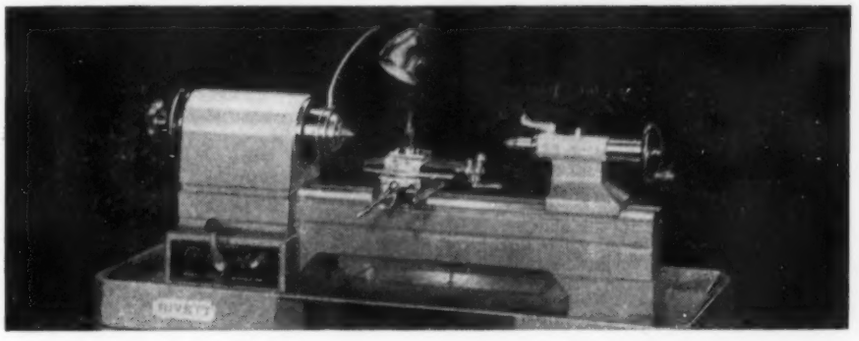


LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* Magna-Matic lathe featuring electronically-controlled feeds and automatic cycle is equipped with both front and rear carriage, each of which may be single or multiple tooled. Four speed ranges using 1200 rpm. motor are available. Unit has swing of 15 in. over bed and 7 in. over carriage. It is available in center distances of 18, 30, 42, 54, and 60 in.→

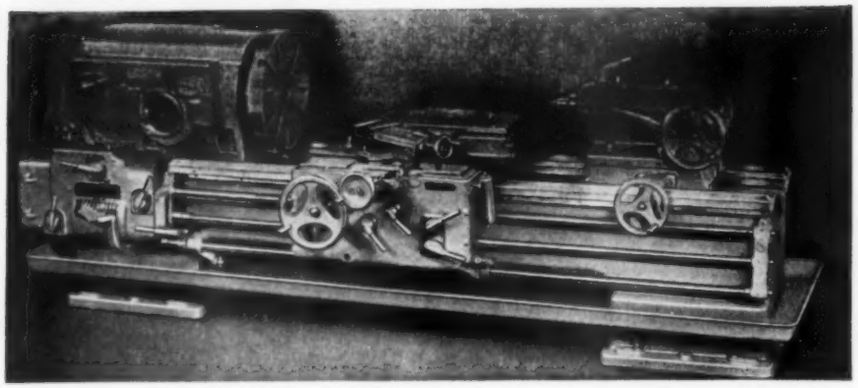
LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* Closed cycle rapid traverse return makes the machining cycle completely automatic on Monarch's 20-in. Model M engine lathe equipped with Type B Air-Tracer. Stepless feed range is ½ to 20 ipm. →



"AIR-TRACER"—*Monarch Machine Tool Co., Sidney, Ohio.* For turning, boring and facing irregular contour work, an "Air-Tracer," type B (previously known as the Bailey duplicating attachment) is available for 14-, 16-, 18- or 20-in. Monarch toolmaker or engine lathes. An air tracer follows a thin metal templet or model. Air loading pressure, established by position of tracer, controls toolslide through hydraulic relay valve.



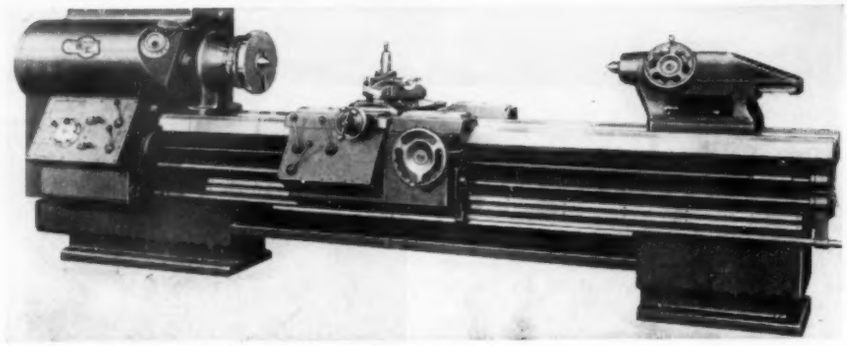
CABINET LATHES—*Rivett Lathe & Grinder, Inc., Brighton 35, Mass.* The 918-S precision cabinet lathe primarily used for turning operations without power feed. It has standard attachments which adapt it for thread chasing, milling, grinding, slotting and spherical turning. It swings 9-in. dia., holds work in draw-in collets to 1⅛-in. dia., in step chucks or jaw chucks up to 6-in. dia. Center distance is 18 in. It is also available as a cabinet turret lathe. →

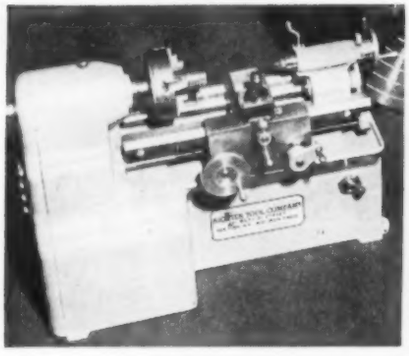


LATHE—*The Sidney Machine Tool Co., Sidney, Ohio.* 25-in. heavy-duty engine lathe features 16-speed dial controlled from herringbone-geared headstock. Gear box provides 48 changes of threads from ¾ to 46, and 48 changes of feeds from 0.003 to 0.207 ← in. per spindle rev.

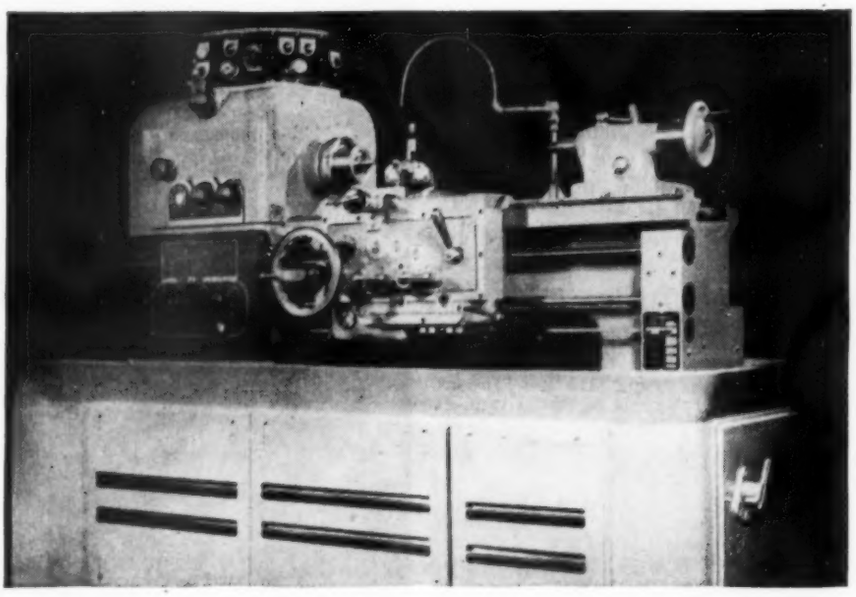
LATHE—*The Boye & Emmes Machine Tool Co., 125 Caldwell Drive, Hartwell, Cincinnati 15, Ohio.* A 25-in. "Golden Anniversary Model" lathe can use carbide tooling, has 16-speed headstock. Gear box provides 64 feed and thread changes. ↓

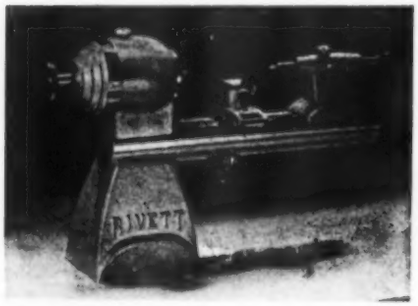
TRACERMATIC — *Cincinnati Lathe and Tool Co., Oakley, Cincinnati 9, Ohio.* The Tracermatic tracer-controlled machine uses a rotating master. Ovals, squares, rectangles with rounded corners, and similar work may be produced. The tracer head is arranged so that it may be swiveled or set at any angle through a range of 180°. Not only are cross and longitudinal movements of the tool controlled, but spindle speed is regulated by the tracer. In order to take care of multicavity molds for the bottle industry, the machine can swing 27½ in. over the bed.





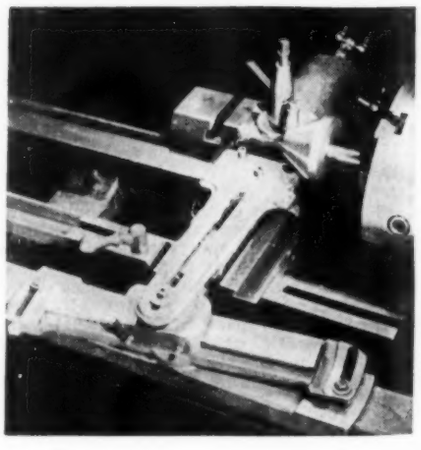
MIDGET LATHE—*Richter Tool Co., 141 West 41st St., New York, N. Y.* ManSon metal-turning lathe, for small, precision work, is 9 3/16 in. long, 3 11/16 in. wide, and 6¾ in. high. There are 3 in. between centers. Swing over carriage is ¾ in. Spindle has 3/16-in. hole through which bar stock up to ⅛ in. dia. can be fed.



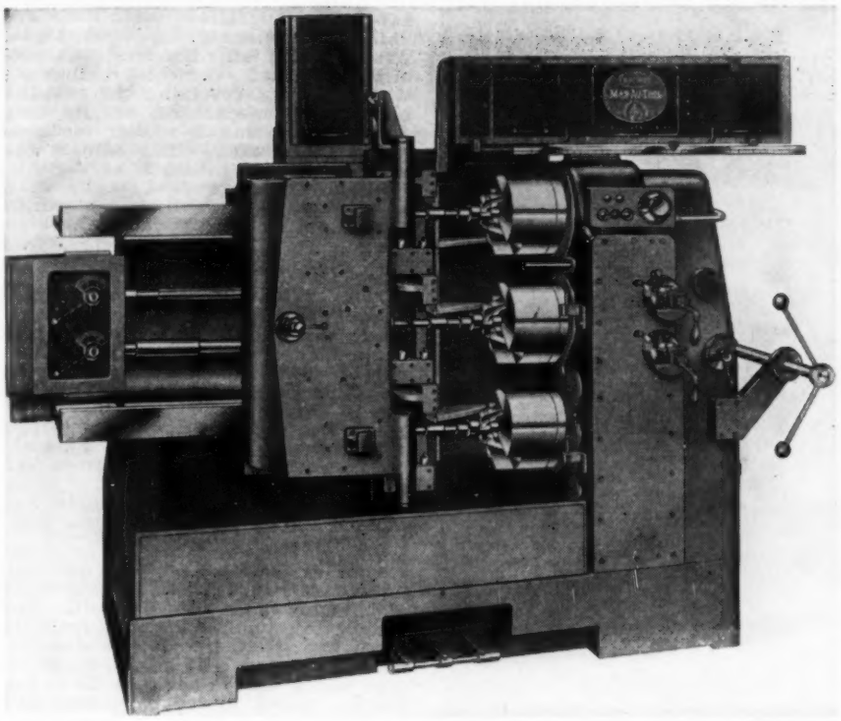


WATCHMAKER'S LATHE — *Rivett Lathe & Grinder, Inc., Brighton 35, Mass.* No. 1R is made from stainless steel, aluminum, and plastics. Headstock is totally enclosed with outboard spindle pulley which permits the use of endless woven belt. Length of bed is 12 in., with 3.94-in. swing and distance between centers of 5 in.

TOOLROOM LATHE—*Rivett Lathe & Grinder, Inc., Brighton 35, Mass.* The No. 1020R precision toolroom lathe, a cabinet lathe capable of turning work up to 10-in. dia. and 20-in. length, has dial adjustment for threading to American and English standards. There are 72 selective feeds or threads. Infinitely adjustable spindle speeds are 24 to 2700 rpm.



TAPER ATTACHMENT — *Master Taper Co., 126 N. Clinton St., Chicago 6, Ill.* Heavy-duty taper attachment for lathes comes in two sizes, 34 and 40 in. between arms, and for V- or flat ways. Capacity: tapers up to 4 in. per ft., 20° maximum in either direction, 16-in. length at one setting. →

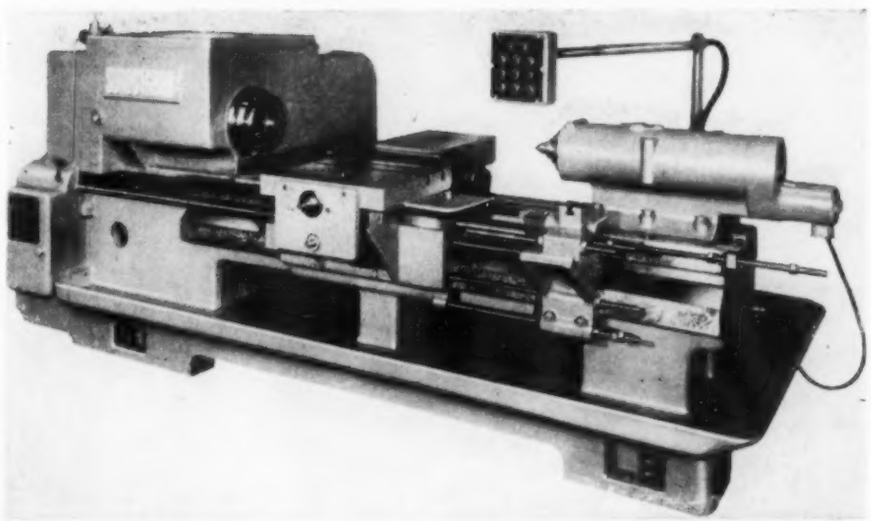


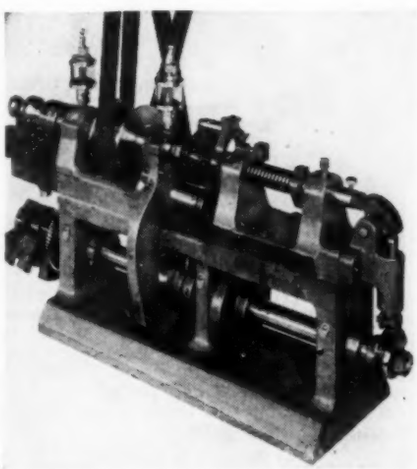
3-SPINDLE LATHE — *Bullard Co., Bridgeport 2, Conn.* A three-spindle shaft-turning, horizontal lathe, the Model 30 Man-Au-Trol, operates automatically through 39 different functions by the Man-Au-Trol control at spindle speeds to 1200 rpm. Tools are mounted in a vertical plane on a slide in back of the three spindles. Multiple tools can be brought automatically into action, either successively or simultaneously. ←

GUARD—*Standard Safety Equipment Co., 232 W. Ontario St., Chicago 10, Ill.* A lathe and wheel guard has all-metal frame, replaceable curved plastic window, and base attachment for setting at desired angle or to moving guard laterally.

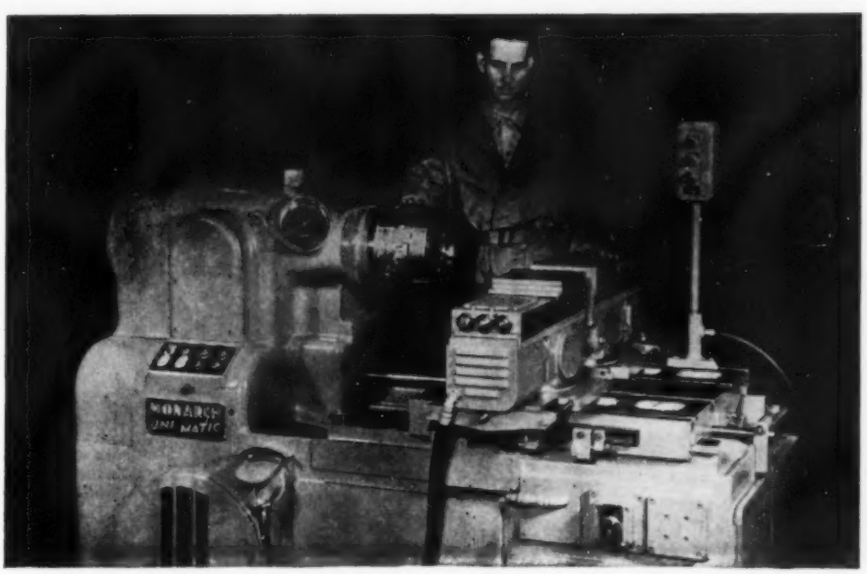
AUTOMATIC LATHE — *Sundstrand Machine Tool Co., Rockford, Ill.* The Model 16 automatic lathe is a multi-tool automatic cycling lathe, and can make full use of carbide tools. Illustrated unit is 60 in. between headstock and tailstock, has 17-in. swing over the slides. Other standard bed lengths provide 36 in. and 84 in. between centers. Spindle-speed range is from 15 to 750 rpm. with a feed range from 0.0025 to 0.100 in. per revolution. Cycle control is by adjustment of dogs in control disk. ↓

WRENCH—*Fen Machine Co., Dept. 1, 1350 Babbit Rd., Euclid, Ohio.* Automatic wrench consists of a variable-torque motor operating a retractable spindle. Two models have maximum torque capacity of 4000 and 6000 lb. in. Selector wheel permits operator to select and hold desired torque which regulates gripping pressure.

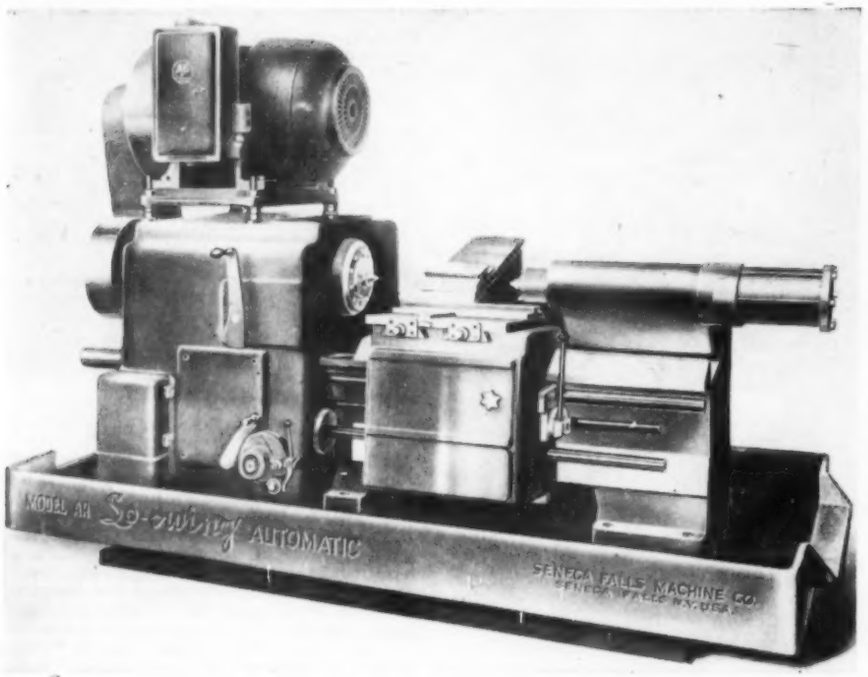




AUTOMATIC MACHINE — *Taylor & Fenn Co., Hartford 1, Conn.* M-109 automatic forming and drilling machine for producing small parts has a capacity of 5/16-in. dia. stock and will produce pieces up to ¾ in. max. length. Spindle speed is 3600 rpm. Tolerance is ± 0.0005 in. in length and diameter. The machines are sold in lots of two—each pair being mounted on a cast-iron bed with coolant trough around the sides.

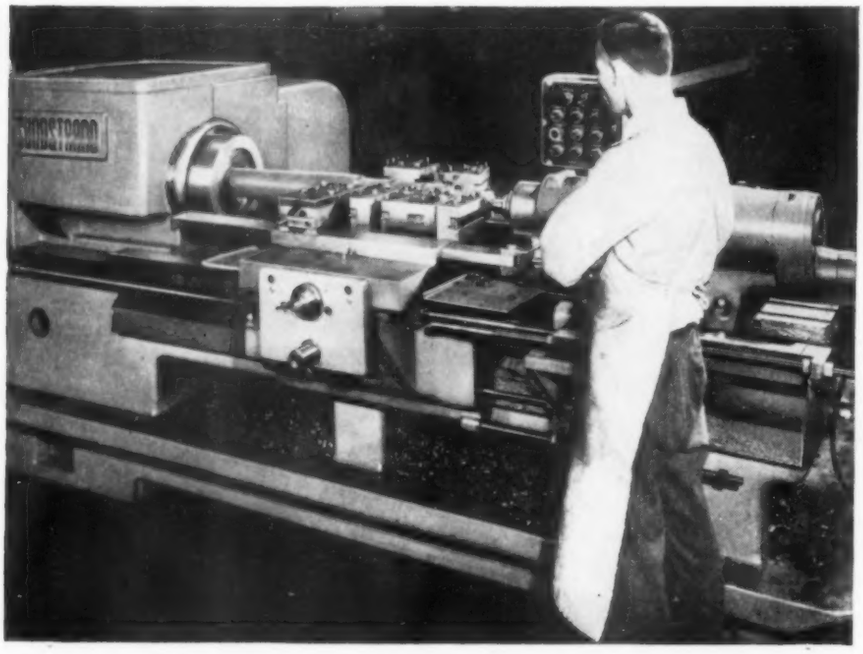


UNI-MATIC LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* Unit is equipped with hydraulic table and can rapidly handle parts that require large amount of loading clearance. Feed rate of table is ½ to 15 ipm., and traverse rate is 40 ipm. Machining cycle is automatic. →

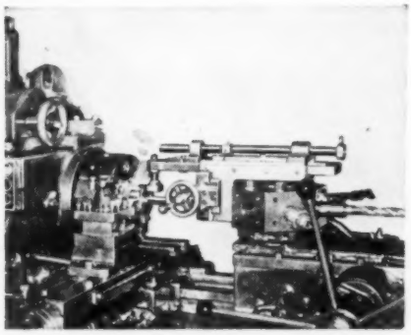


LO-SWING LATHE—*Seneca Falls Machine Co., Seneca Falls, N. Y.* Model AR Lo-Swing lathe has an instantaneous tool-relief control mechanism which permits reversing the rotation of the feed mechanism at any time during the cycle. A similar model is the AP Lo-Swing which utilizes the same head and tailstock as the AR. However, carriage feed is by rack and pinion instead of by cam which permits unlimited carriage travel. ←

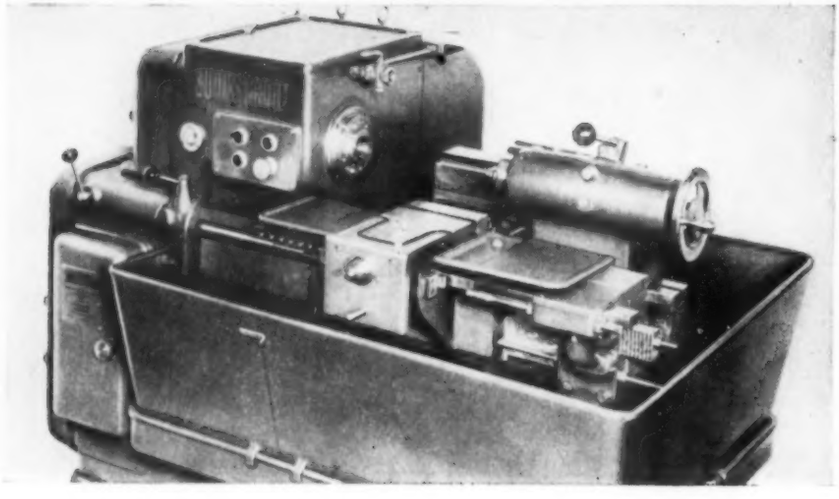
AUTOMATIC SIZING—*Monarch Machine Tool Co., Sidney, Ohio.* An automatic sizing unit converts a standard engine or toolmaker's lathe from manual to automatic operation for such work as step-shaft turning, boring, facing, and contour turning. When not in use, the unit does not interfere with normal functioning. Separate motors for length feed and cross feed are electronically controlled. Available on Monarch 14-in. engine and toolmaker's lathes and on larger sizes.



AUTOMATIC LATHE — *Sundstrand Machine Tool Co., Rockford, Ill.* The Model 16 automatic lathe is made in three bed lengths: 36, 60 and 84 in. between centers. It has 17-in. swing over slides and will take a 21-in. dia. chuck. Quick cycle changeover and a 75-hp. motor make it possible to multiple-tool the lathe for short runs as well as production turning. Complete cycle control is provided by adjustment of dogs on a cycle control ←disk.

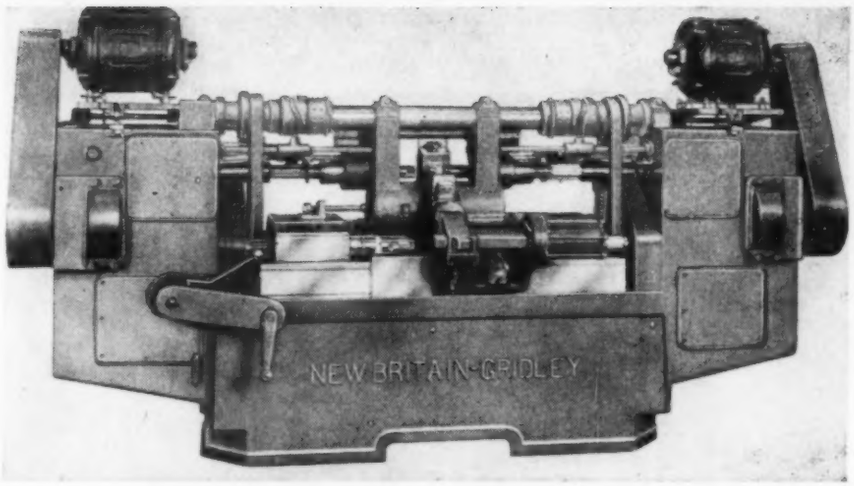


REEVE TURRET ATTACHMENT—*Artesan Tool and Cutter Co., 521 Vester St., Ferndale 20, Mich.* New model is said to simplify boring of tapers and profile holes with any turret lathe and hand screw machine. Attachment is set to any dia. and taper is said to be completed in 1 min.

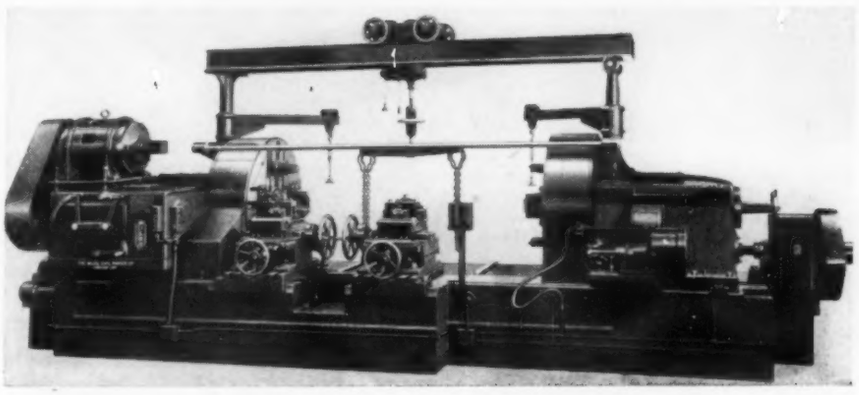


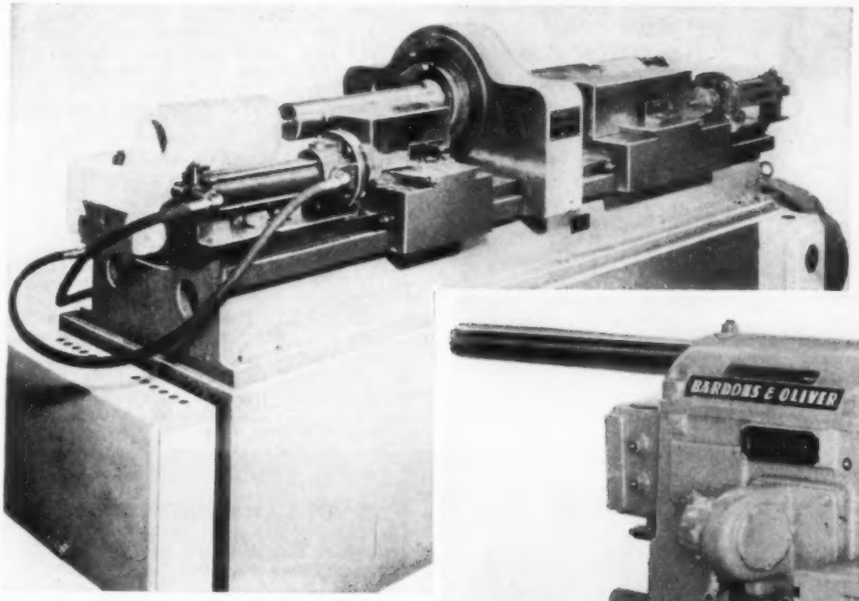
AUTOMATIC LATHE — *Sundstrand Machine Tool Co., Rockford, Ill.* The Model 4 Automatic lathe is designed for multiple tooling and fast automatic cycling on short-run as well as long-run work. Front-carriage feeds are from 0.0015 to 0.054 in. per rev. Maximum swing over front and rear slide is 9½-in. dia. Made in three types. Types "A" (3-hp. spindle-drive motor) and "B" (5 hp.) have two sets of pick-off gears giving eight spindle speeds and 60:1 ratio. Type "C" has belt drive, is furnished for one speed, and speed ← is changed by changing pulleys.

DOUBLE-END MACHINE—*New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.* The Model 365 double-end tool-rotating chucking machine has three working spindles on each side with a central work-holding fixture. Threading is controlled by positive cam or leadscrew. Opposite ends of the same piece can be machined simultaneously, or two similar pieces can be machined. →

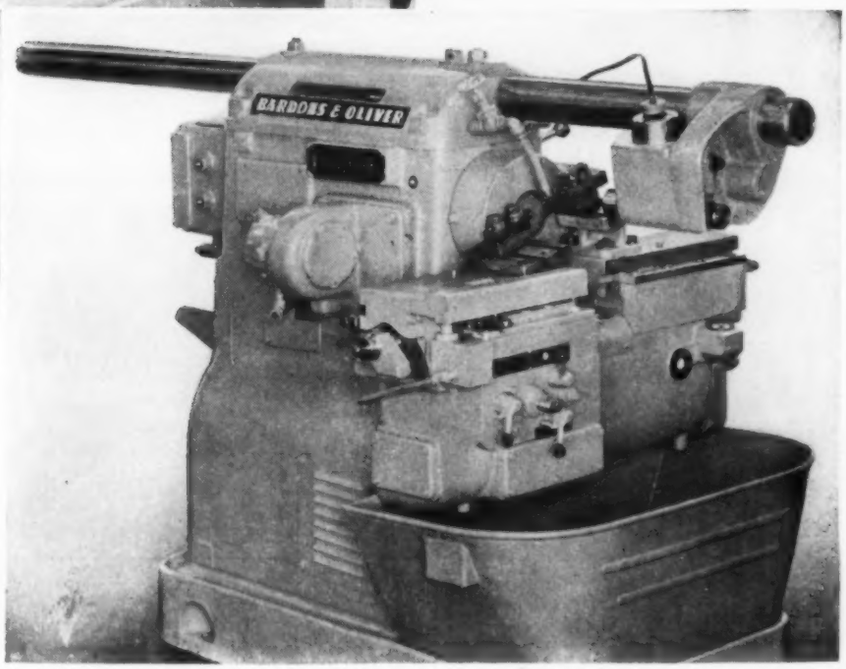


CAR-WHEEL LATHE—*Niles Tool Works Div., Lima-Hamilton Corp., Hamilton, Ohio.* An improved car-wheel contour-turning lathe handles 26- to 52-in. tread-dia. car wheels. The left-hand headstock is bolted down, and the right-hand headstock is provided with power traverse. Faceplates have T-slots and have four Niles equalizing drivers which engage wheels near the rim. A calipering device enables the operator to size both wheels to equal diameter. →

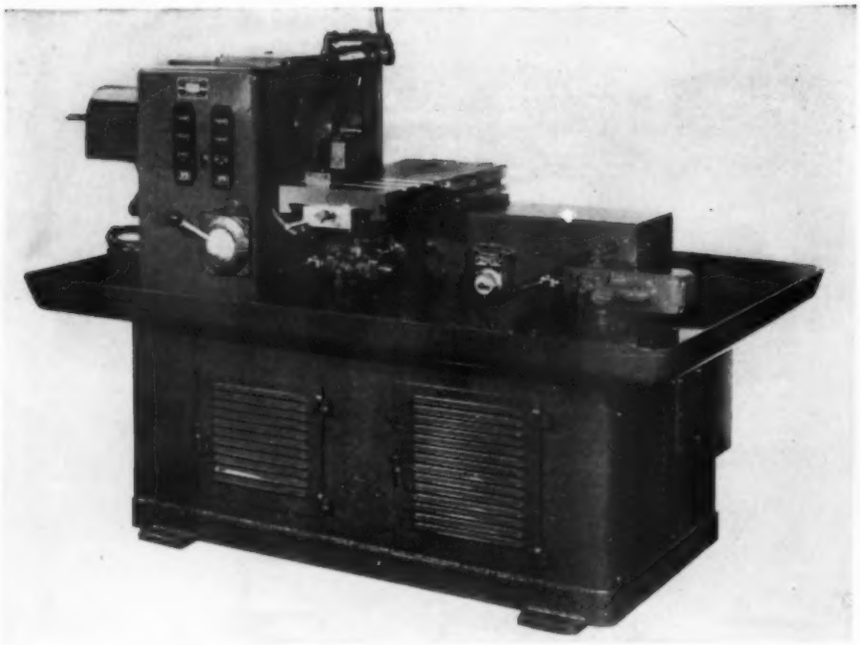




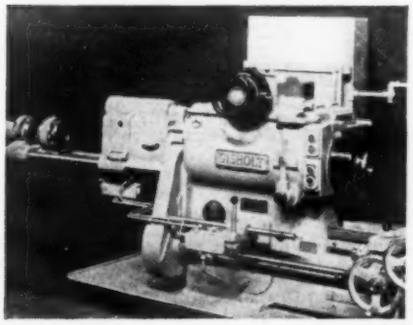
AUTOMATIC LATHE — *Bardons & Oliver, Inc., 1133 W. 9th St., Cleveland 13, Ohio.* The hydroelectric automatic lathe chamfers and cuts off parts made from pipe, tubing or solid bar stock. Made in two sizes: No. 33 takes 3-in., and No. 34 takes 4-in. tubing. It operates as a single-cycle manually controlled machine at full-cycle automatic with 30 or more cycles per min. with one or more pieces per cycle. ↓



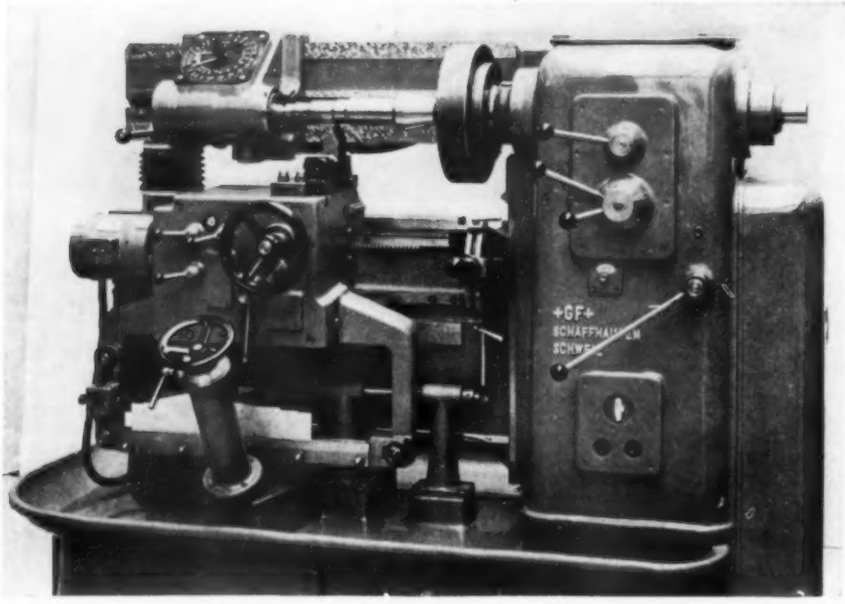
AUTOMATIC UNITS—*Stanford-Roberts Mfg. Co., Dover, Ohio.* Two machines have been added to the line of Benjamin automatics. One is a shaft automatic that can machine both ends of a shaft at the same time. Capacity of the unit is ½ to 4¾-in. dia., 60 in. long with 7-in. dead-center space. The other machine is a centering automatic for facing, centering, drilling, turning and threading both shaft ends simultaneously. Unit has a shaft capacity of ⅛- to 1½-in. dia., with 5- to 30-in. length.



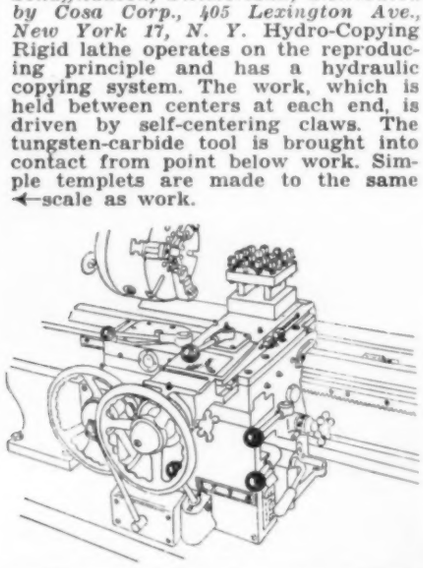
SEMI-AUTOMATIC LATHE — *Oster Mfg. Co., Cleveland 5, Ohio.* A semi-automatic lathe, No. 650, is equipped with a 7½-hp., 4-speed motor and hydraulic feeds. Either single- or double-action cross-slide can be furnished. The hydraulically operated cross-slide provides an automatic cycle of fast approach, feed, dwell, fast retraction, ←and stop.

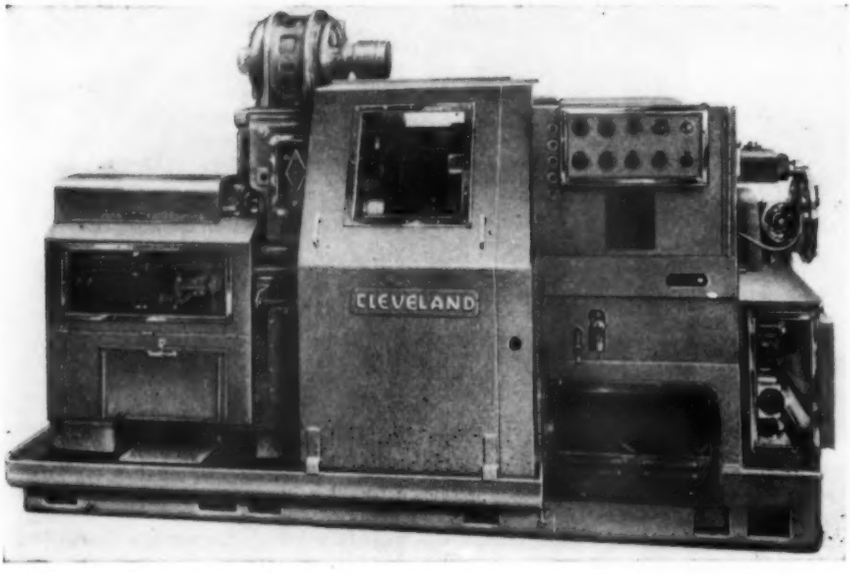


TURRET LATHES—*Gisholt Machine Co., Madison 3, Wis.* A new rapid-acting hydraulic bar feed and collet chuck is available for all new ram-type turret lathes. A forward movement of control lever on front of machine advances bar stock up to 6 in. as determined by a stock stop, requiring no physical effort by operator.



HYDRO-COPYING LATHE — *George Fischer Steel and Iron Works, Ltd., Schaffhausen, Switzerland, distributed by Cosa Corp., 405 Lexington Ave., New York 17, N. Y.* Hydro-Copying Rigid lathe operates on the reproducing principle and has a hydraulic copying system. The work, which is held between centers at each end, is driven by self-centering claws. The tungsten-carbide tool is brought into contact from point below work. Simple templets are made to the same ←scale as work.

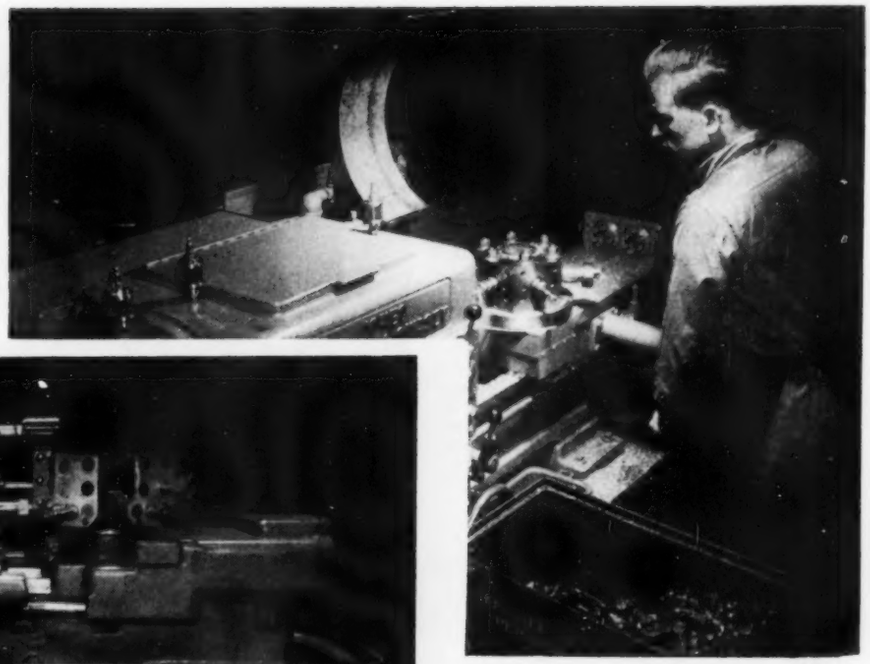




TURRET LATHE—*Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* A single-lever controlled rapid traverse for the carriage cross-slide and saddle is incorporated in the 2-A turret lathe. Positive locating and clamping of the hexagon turret eliminates the conventional spring-seated lockbolt.

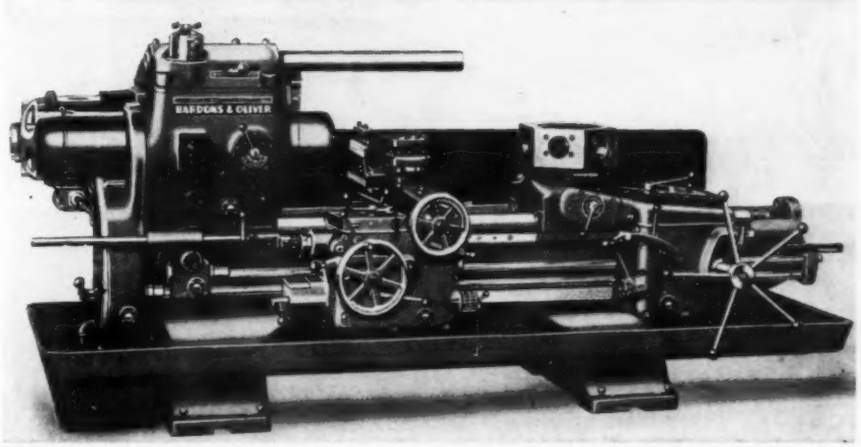
TURRET MACHINE—*Cleveland Automatic Machine Co., 4932 Beech St., Norwood, Cincinnati 12, Ohio.* A single-spindle automatic turret machine, the 2½-in. Dialmatic Model AB, has an electric tool-feed drive which makes independent, infinitely variable forward and return tool feeds possible without requiring cam changes for each of five tool positions in the turret ←head.

TURRET LATHES—*The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Automatic-drum control is incorporated in the line of Electro-Cycle turret lathes. Mounted on the ram and mechanically actuated by either forward or backward indexing of the hexagon turret, it automatically controls the working sequence. Lathe has a 1½-in. bar capacity and will swing 16⅞ in. over the bed. Primarily for brass, it can turn other non-ferrous materials. Four drums in the automatic control serve start and stop, reverse for threading, high and low speed, right-, left-hand rotation. →

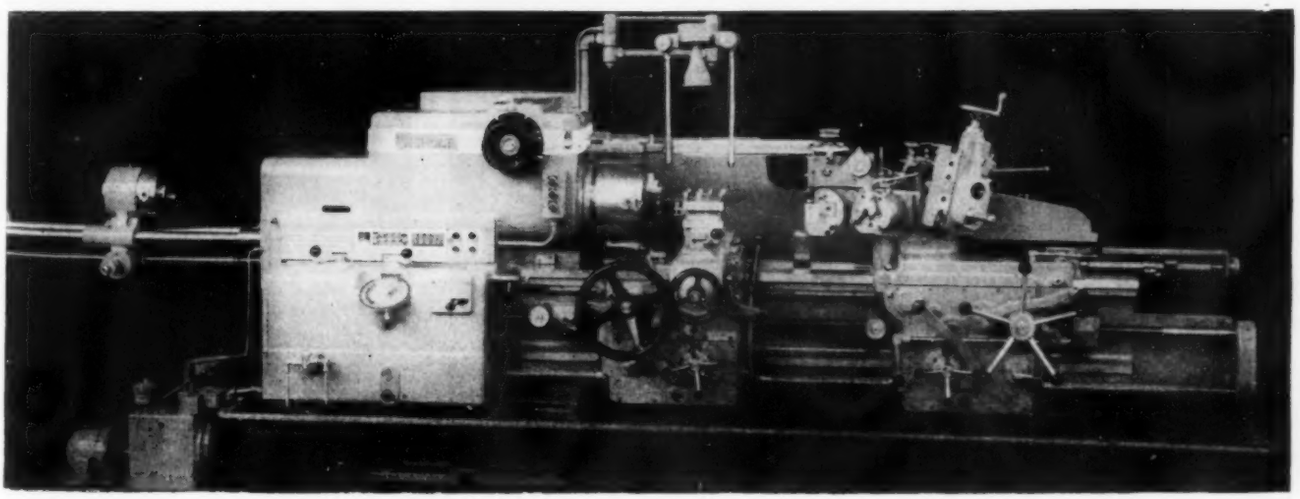


TURRET LATHE—*Potter & Johnston Machine Co., Pawtucket, R. I.* The 3U Speed-Flex small-size turret lathe machines castings and forgings up to 6-in. dia. weighs 5,000 lb. The standard model is regularly furnished with spindle speeds from 73 to 1445 rpm. The high-speed model has a speed range ←from 104 to 2068 rpm.

TURRET LATHE—*Bardons & Oliver, Inc., Cleveland 13, Ohio.* No. 22 saddle-type turret lathe is designed to take 3½ and 4½ in. bars and to do chucking work. It has 15½ in. swing over the cross slide and 23½ in. over the guides of the bridge-type carriage. Nine pre-selective hydraulic feed changes in either high or low speed ranges are available on both the turret and the saddle. →



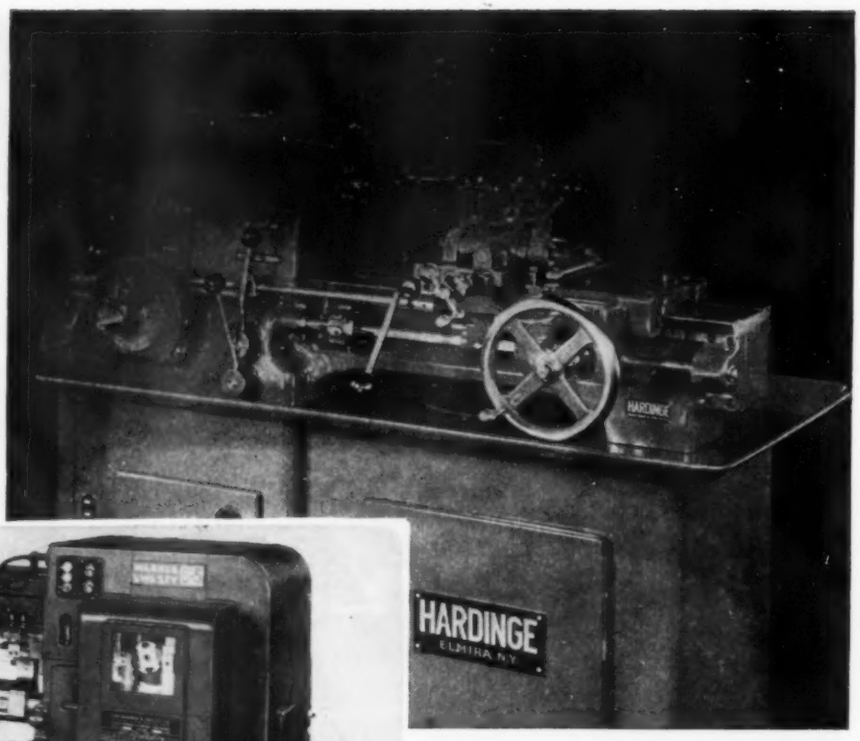
TURRET LATHES—*Gisholt Machine Co., Madison 3, Wis.* Model 1L and 2L saddle-type turret lathes have been completely redesigned. Accessibility has been emphasized for all adjustments. The 1L saddle-type turret lathe (illustrated) can also be used for bar or chucking work without alteration of chucking devices. ↓



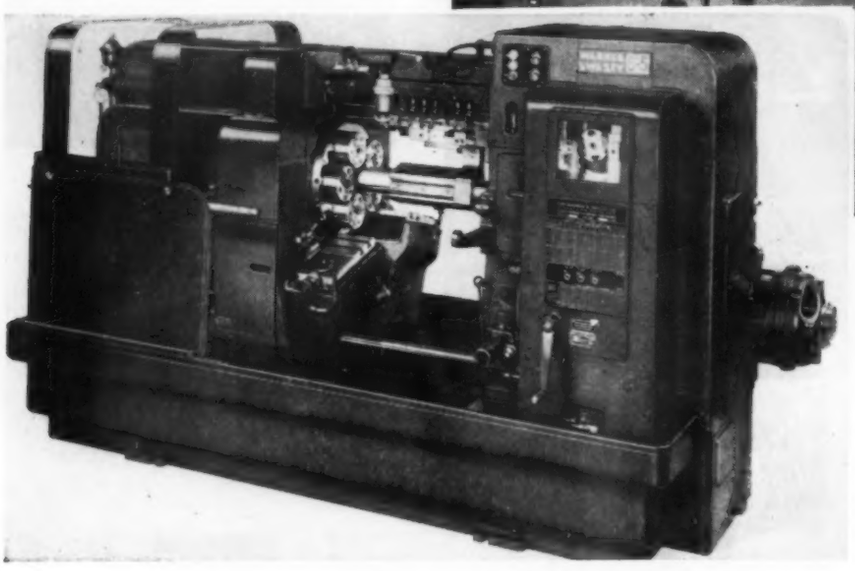
TURNING

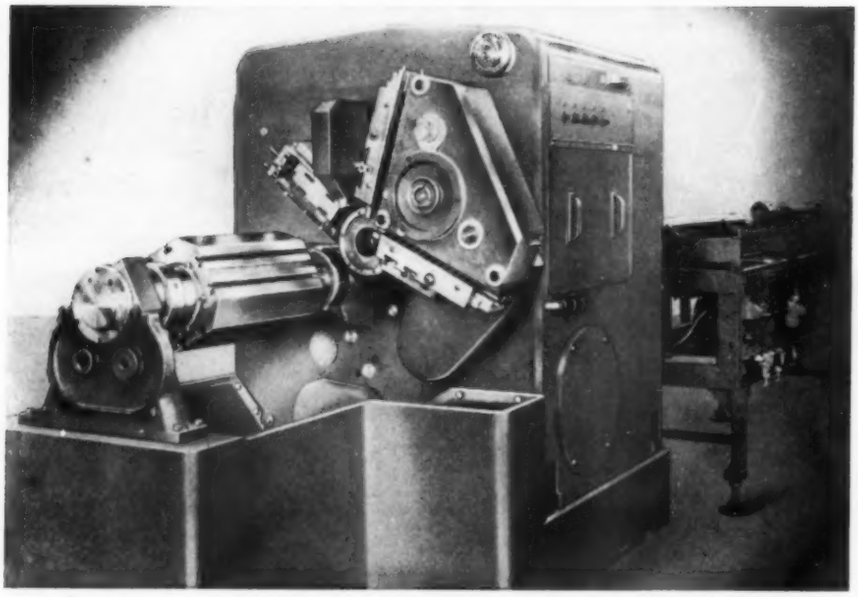
AIR TRACER — *Monarch Machine Tool Co., Sidney, Ohio.* Type A "Air Tracer" performs work beyond the versatility of Type B unit. Unit employs two hydraulic cylinders instead of one: one controls cross movement and the other controls longitudinal movement of cutting tool. Toolslides are set at a 90° angle.

CHUCKING MACHINE — *Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* A 6-in., 5-spindle automatic chucking machine can be set up rapidly without the use of special cams. Feed stroke is adjustable with a wrench on quadrants. Secondary feed is obtained by combined movement of a rack and a transfer pinion, giving rapid advance and return. Five cross-slides are operated by camless speed mechanisms in the same manner as the main slides.

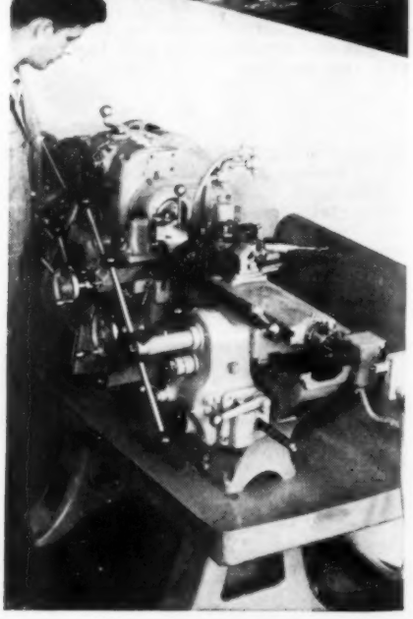


CHUCKING MACHINE — *Hardinge Brothers, Inc., Elmira, N. Y.* A multi-operation chucking machine will turn, bore or thread parts up to 6-in. dia. that normally require many individual setups. Parts can be produced on a rapid production basis. The headstock spindle has a speed range of 150 to 3,000 rpm., forward or reverse. The turret has eight stations, each of which can be adjusted without affecting the others.



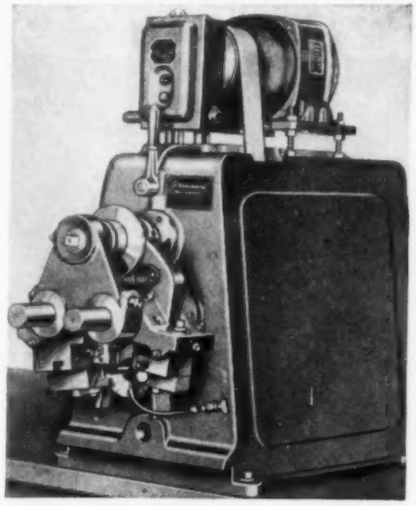


TURRET LATHE—*New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.* A line of automatic turret lathes No. 150, is designed to bridge the gap between a lathe and an automatic screw machine. To set approach dogs and preselect feed for any face of the turret takes less than a minute. There is independent operation of the main turret and cross-slides. The 5-in. capacity machine has a speed range up to 1,000 rpm. and is designed for full use of carbide tools.



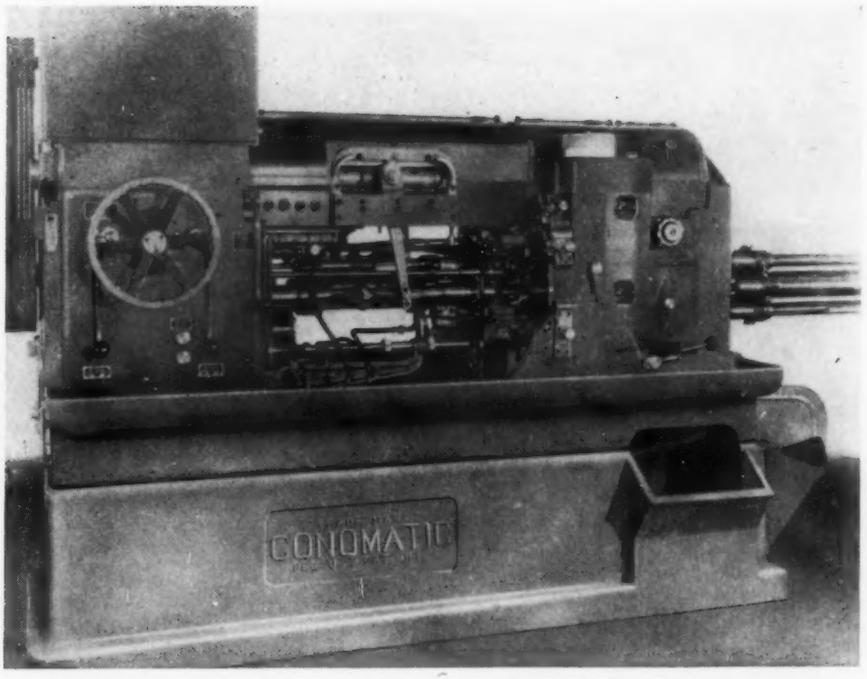
TURRET LATHES—*Bardons & Oliver, Inc., Cleveland 13, Ohio.* Remote electric control of spindle speeds and direction adapt the geared electric turret lathes Nos. 1 and 2 to tapping and threading operations. When a tap reaches the desired depth, the spindle automatically reverses. When the tap is backed out the spindle rotation is reversed to normal direction.

SINGLE-SPINDLE AUTOMATIC — *Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Chucking machine has a ram with pentagonal turret to carry tools, two cross-slides front and rear, four spindle speeds and three feeds, automatically controlled. The range of speeds and feeds is obtained by pick-off gears. Work to 6-in. dia. can be held in the air chuck.

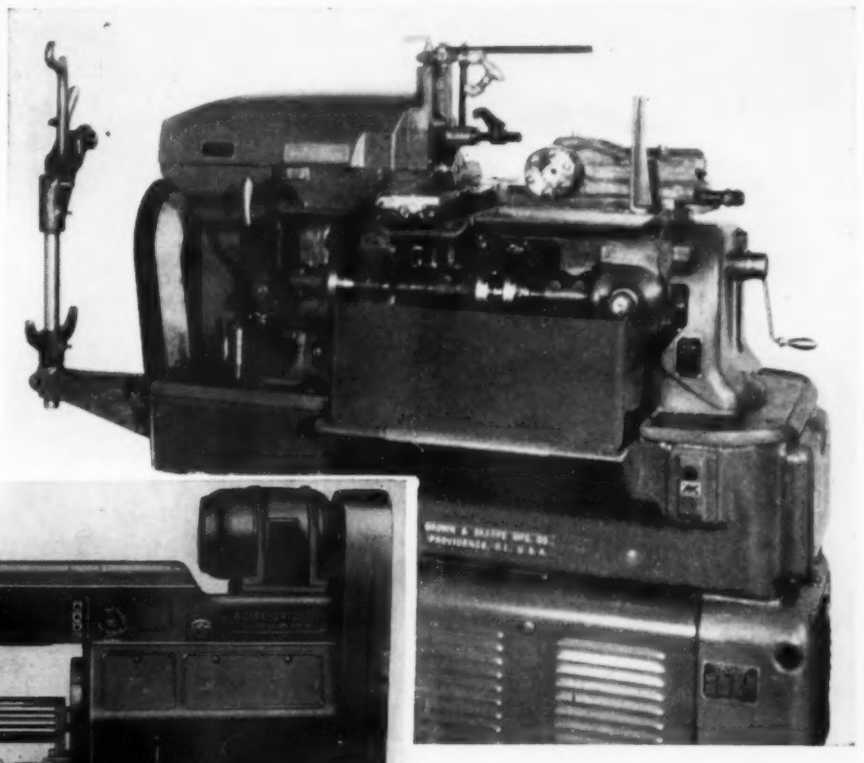


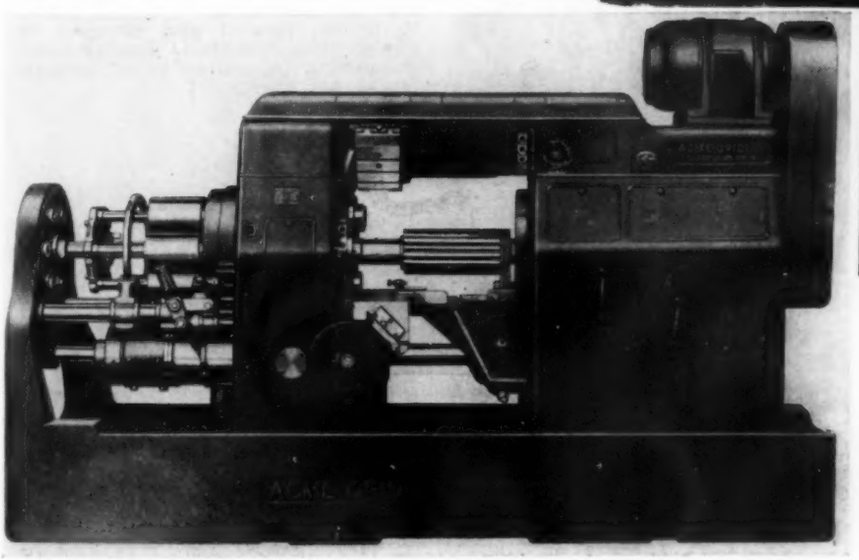
SCREW MACHINE — *Standard Machinery Co., 1565 Elmwood Ave., Providence, R. I.* No. 2 automatic screw machine will accommodate all normal screw-machine operations on bar stock to 1-in. dia., with the exception of thread cutting. It is said to eliminate the formation and clogging of long chips. Twice in each revolution of the spindle, the rotation of the feed camshaft is interrupted while it vibrates harmonically with an amplitude sufficient to break each chip.

SCREW MACHINES — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Nos. OOG and OG high-speed automatic screw and automatic cutting-off machines have been redesigned. Spindle is of unit construction and can be removed. Spindle speeds in 196 two-speed combinations are provided in 16 groups. A set of 16 gears provides all changes. Idle machine movements such as changing speed and indexing turret are independent of spindle and production speeds. →

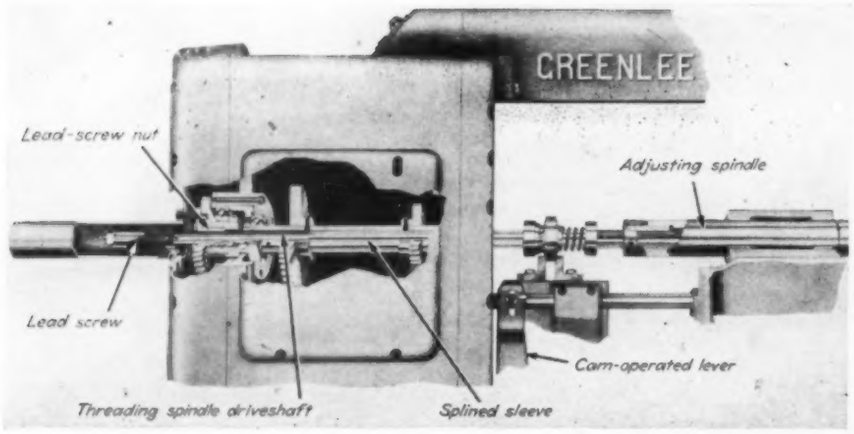


CONOMATIC — *Cone Automatic Machine Co., Inc., Windsor, Vt.* Faster spindle speeds are available in this 1-in. bar, 6-spindle Conomatic than in previous machines of the line. It will produce two mating parts in one machining cycle utilizing 25 tools and 6 attachments. Another new machine is the "Multi-Single" multiple-spindle bar machine for volume production of pieces that require few machining operations.

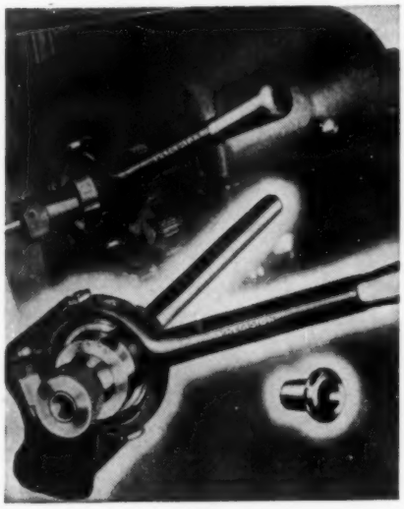




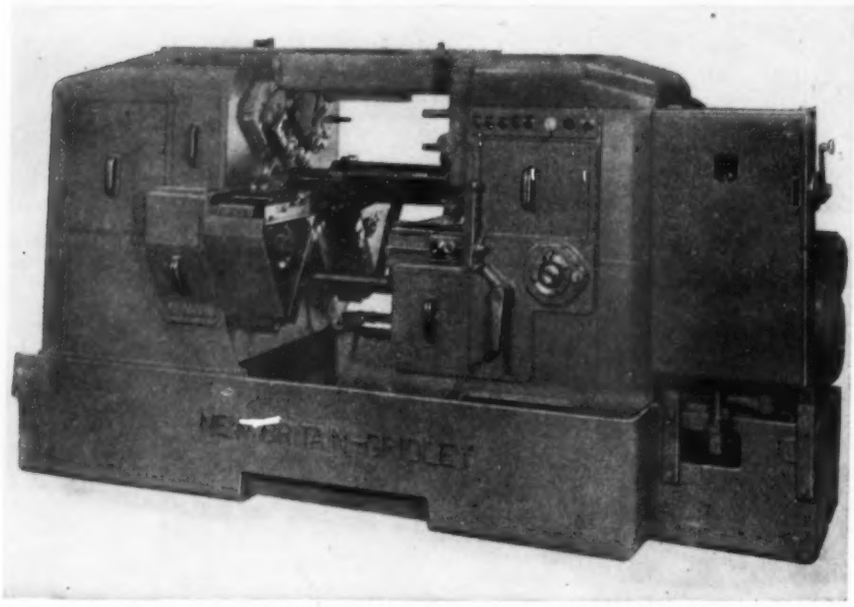
SCREW MACHINE — *National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* 1¼ in. RB Acme-Gridley Bar automatic screw machine weighs 3,000 lb. more than its predecessor. The weight is distributed to resist vibration. Attachments have been added to include operations that were previously done ←on secondary equipment.



LEAD-SCREW THREADING—*Greenlee Bros. & Co., Rockford, Ill.* An improved threading arrangement which is said to eliminate many secondary operations and speed production on work requiring threads with very accurate lead is available for 6-spindle automatic screw machines of 1-, 1⅝- and 2-in. bar capacity. Cutaway section shows the lead-screw threading attachment in 5th position ←on a 6-spindle automatic.

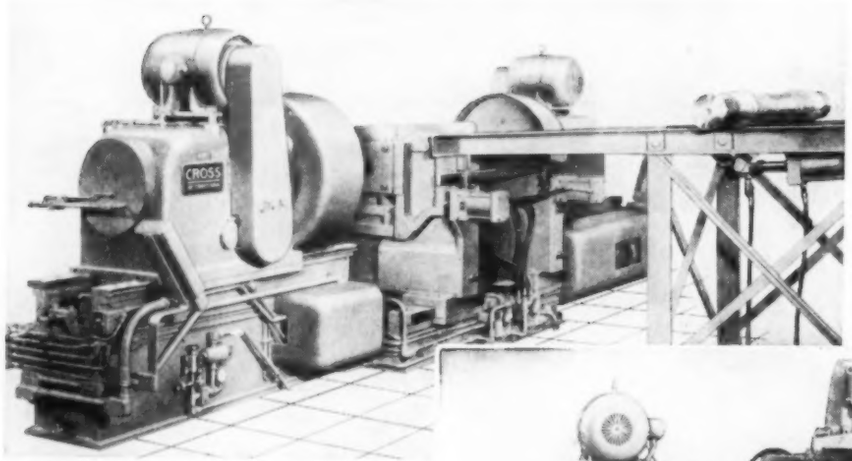


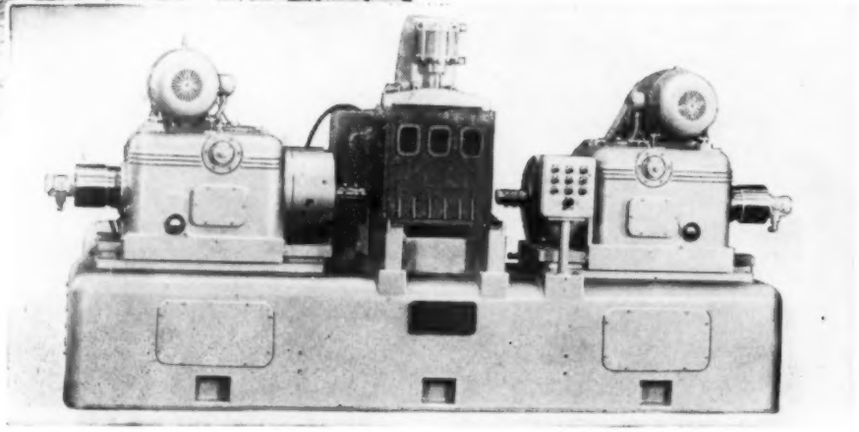
LEVER-TYPE DRAWBAR—*General Die and Stamping Co., 262-272 Mott St., New York 12, N. Y.* The Precision lever-type drawbar is for production use on ½-in. collet-capacity lathes. Where there is a slight variation in work diameter, the drawbar adapts itself automatically. It has three positions of tension adjustment.



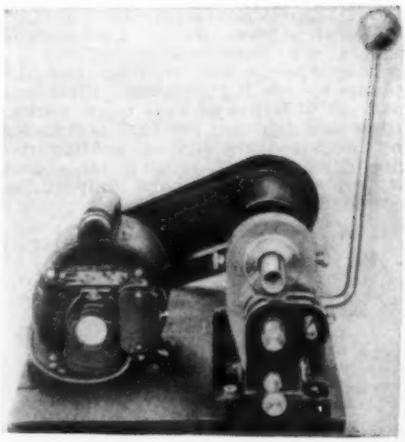
←
SCREW MACHINES—*New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.* A new line of multiple-spindle automatic screw machines, No. 601, are available in 1¼- and 2¼-in. sizes. Six independently cammed cross-slides are radially arranged about the axis of the spindle carrier to provide the same line of forming thrust for every position.

SPECIAL MACHINE—*Cross Co., Detroit 7, Mich.* Unit utilizes carbide-tipped toolbits for facing main bearings on diesel-engine cylinder blocks. Parts are located and clamped by power, then machined automatically. Production is said to be 41 cylinder blocks net hourly. ↓

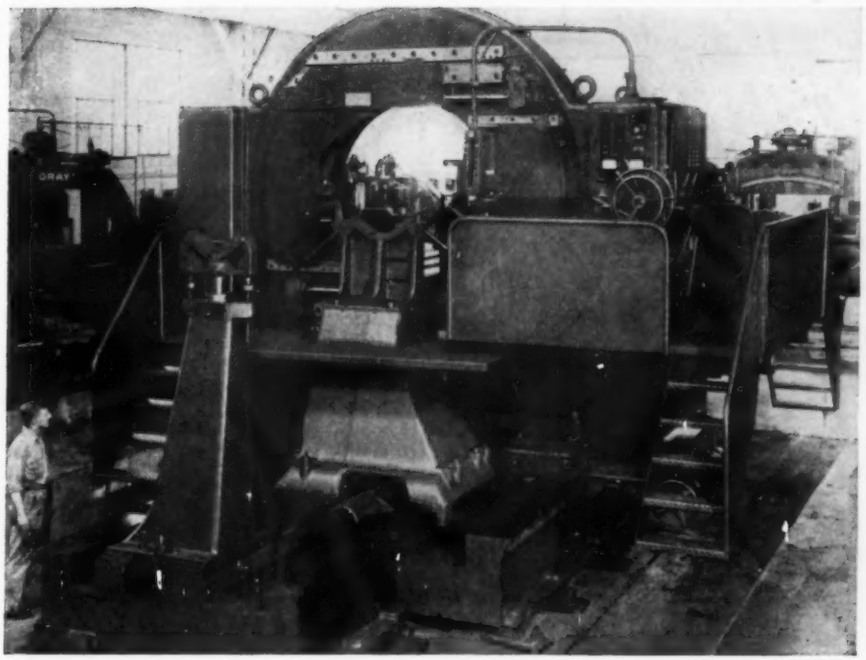


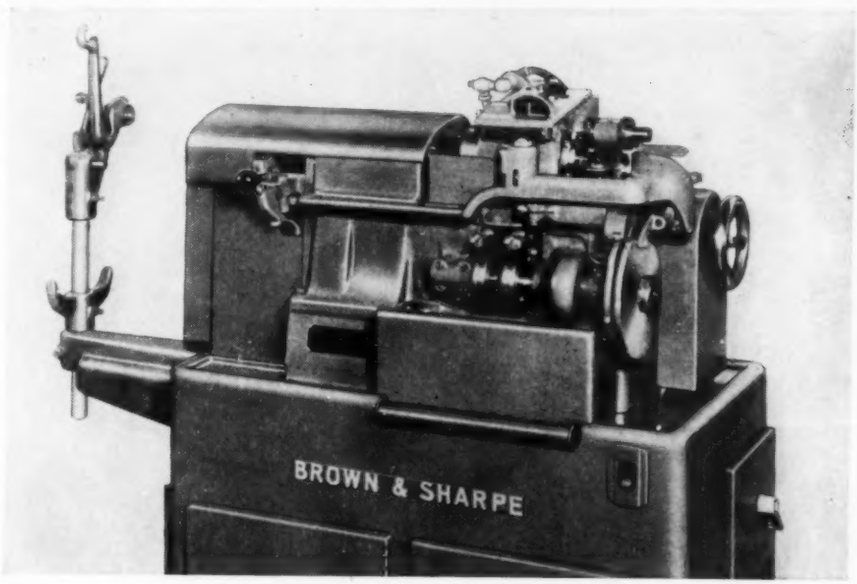


TRANSFER-MATIC—*The Cross Co., Detroit, Mich.* Transfer-matic can produce from 15 to 20 railroad-car axles per hour at 80% efficiency. It consists of three machines with connecting conveyors. First machine is a two-station, double-end type which holds the rough forging stationary as rotating tools remove scale, groove and shear off crop, center drill. Second machine is a single-station, double-end automatic lathe for rough turning end collars, journal dust-guard diameters and wheel seats. Third machine puts a smooth face on both ends of the axle.



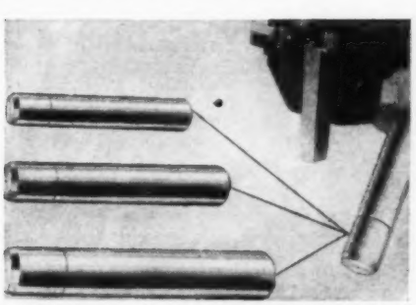
DEBURRING MACHINE—*Beach Machine Works, 515 Long Beach Blvd., Long Beach, N. Y.* A high-speed deburring, facing and chamfering machine handles ferrous and non-ferrous metals and plastics. Two interchangeable holding dies with self-centering jaws have capacities of 3/16- to 2-in. dia. and up to 3½-in. dia.

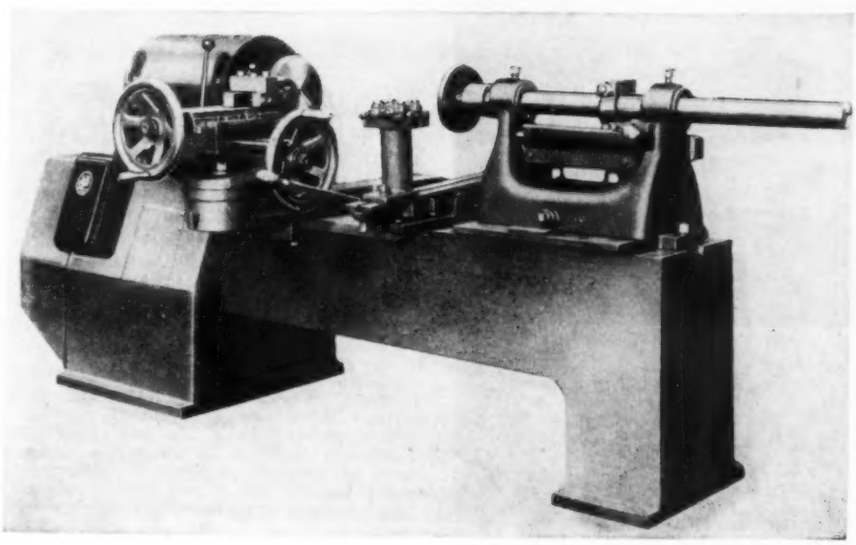




CRANKPIN TURNING—*Wickes Brothers, Saginaw, Mich.* Unit machines large diesel and similar crankshafts has five sizes of crankpin-turning machines ranging in weight from 27,000 to 240,000 lb. Crankshaft is set up on stanchions, while cutting tools revolve around crankpin.

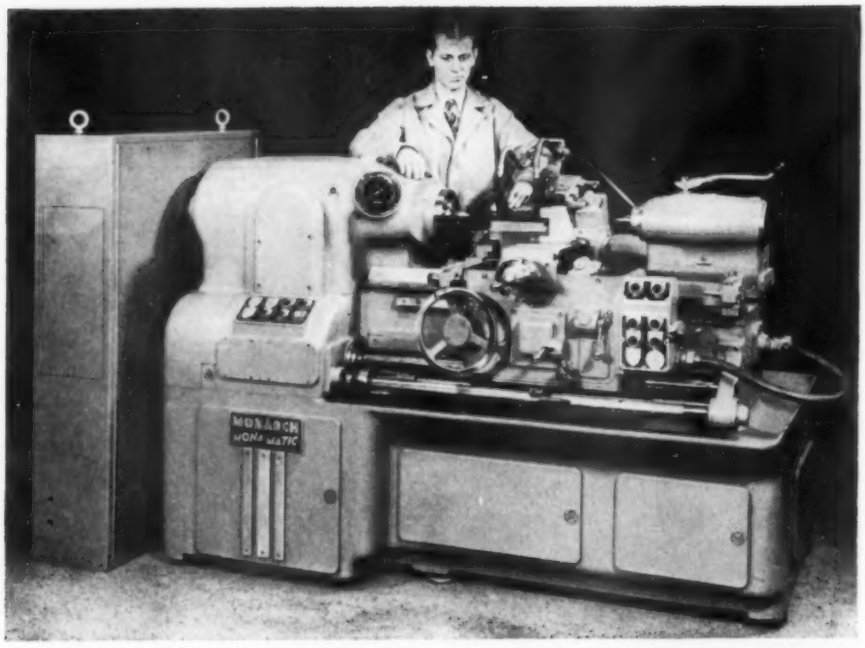
PINION-TURNING—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Automatic pinion-turning machine features simplicity of setup duplication. Circular-formed single-point tools are used. Machine incorporates a built-in tool-resetting indicator and centering gage, and individual micrometer stops for each of the eight tool positions. Change gears provide rates of production from 3 to 364 sec. per piece per cycle. Largest feeding finger accommodates stock to ¼-in. dia. and ←turns up to 2⅞-in. length.





REVOLVING STOP — *Boyar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* A revolving stop screw machine, the unit has a free-turning, ball-bearing head designed to reduce friction between work and stop to prevent marring of piece parts. The stop is made in three sizes and seven lengths.

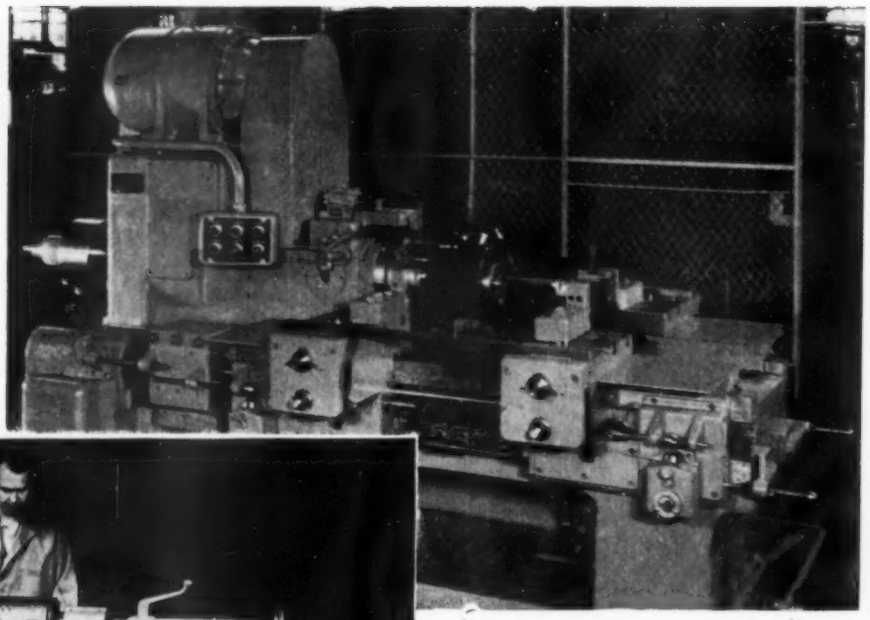
SPINNING LATHES—*E. W. Bliss Co., Detroit 2, Mich.* A line of second-operation spinning lathes is designed to bulge, neck, bead, wire, flange, curl and trim a variety of drawn or spun shells after they have gone through primary operation in a toggle press. The lathes come in two sizes with up ←to 30-in. swing, 92-in. bed length.

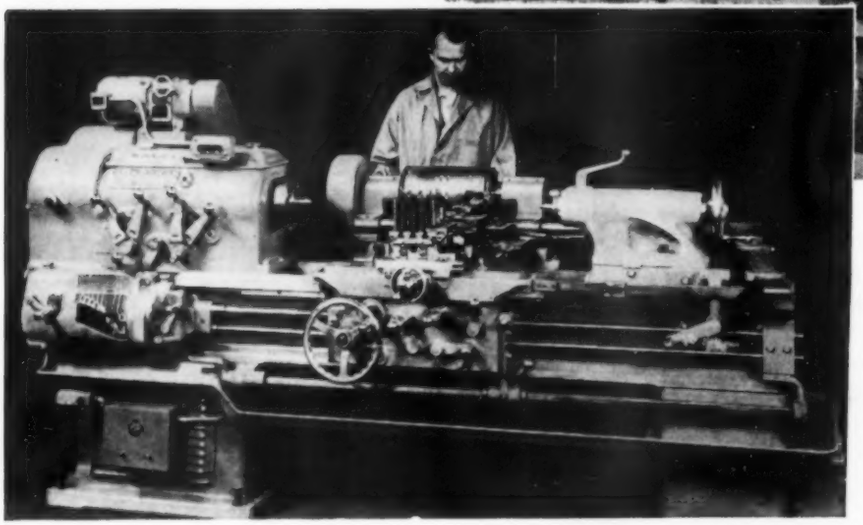


LATHE CONVERTERS—*Master Mfg. Co., Hutchinson, Kan.* Lathe converters are improved to include 24 spindle speeds for milling and 12 spindle speeds for grinding. Sizes are made to fit lathes of 9- to 60-in. swing. Other new features are four post locks for increased rigidity, a holding device consisting of milling table and angle plate, and outboard support for extended arbors.

AUTOMATIC LATHE — *Sundstrand Machine Tool Co., Rockford, Ill.* Designed to turn electric-motor stator frames, lathe handles standard frames from No. 225 through 284 NEMA sizes. Two front and two rear carriages machine rabbet fits in both ends simultaneously. ↓

MONO-MATIC LATHE — *Monarch Machine Tool Co., Sidney, Ohio.* Lathe is designed as a manual or semi-automatic machine for doing first- and second-operation work on gear blanks, straight and flange bushings, and various types of shafts with one or more steps. It has spindle speeds from 75 to 3,000 rpm., and front and rear carriages with several automatic features.

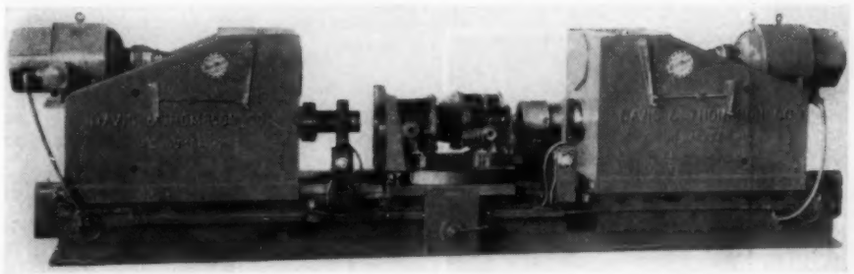




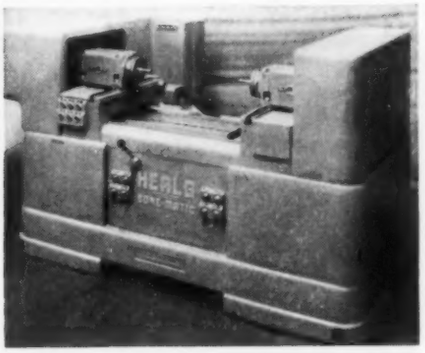
ENGRAVING LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* It is said to turn shapes and designs heretofore only produced by hand engraving. Master record shape can be transmitted to work same size or any ratio of reduction. Max. dia. that can be engraved is 15 in.; max. length is 9 in. ←

Boring

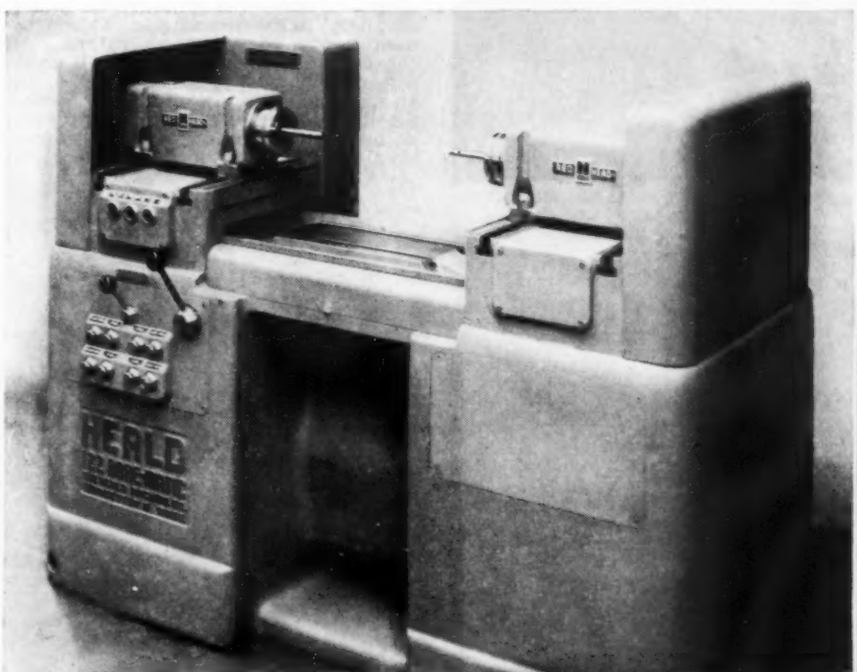
AMERICAN MACHINIST 35th ANNUAL REVIEW



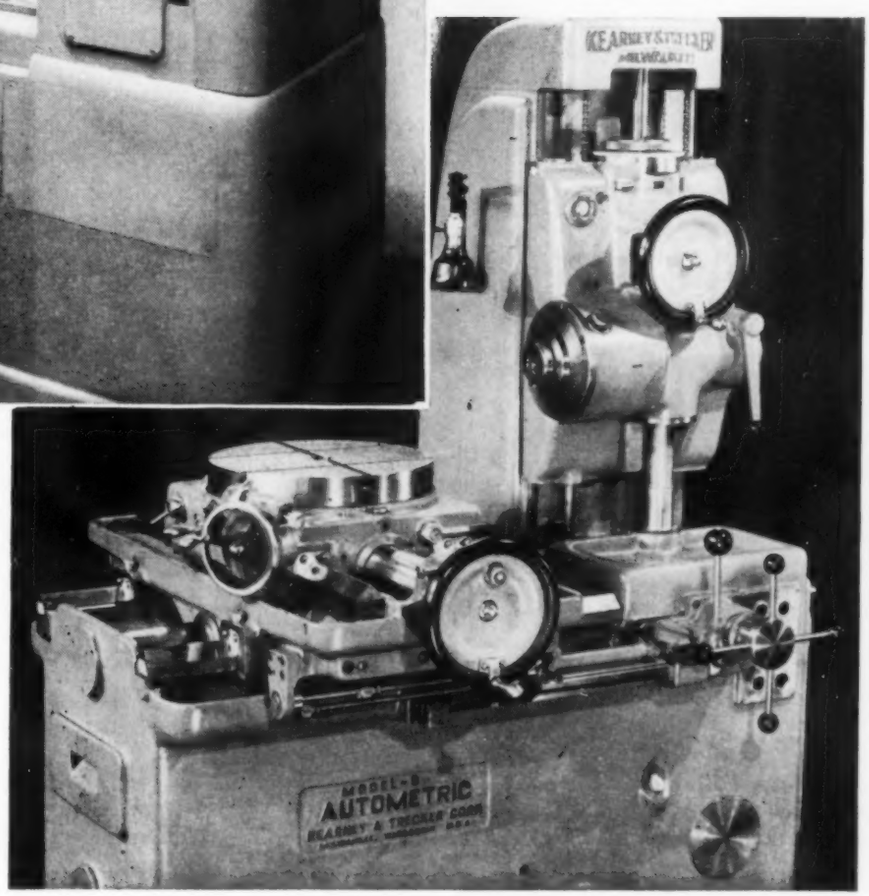
BORING MACHINE—*Davis & Thompson Co., Milwaukee 1½, Wis.* The 2 WI 2-way boring machine bores large holes to accurate dimensions at high production rates. Machine illustrated bores a 14¾-in. dia. hole from one side and a 9-in. dia. hole from the other side. Both holes are 12 in. deep. The workpiece is a locomotive air compressor.



BORE-MATICS—*The Heald Machine Co., Worcester 6, Mass.* Models 221 and 321 (single-end) and 222 and 322 (double-end) Bore-Matic precision finishing machines, are for medium and large work. They can be arranged with single or multiple spindles, and can do rough and finish boring, turning, facing, chamfering, grooving or fly-cutting. Models 221 and 321 single-end Bore-Matics are alike except for size. Width of bridges is 20 and 23⅝ in. respectively, and maximum table travel is 15 and 20 in. The double-end units are similar to the single-end units, Model 222 being the smaller.



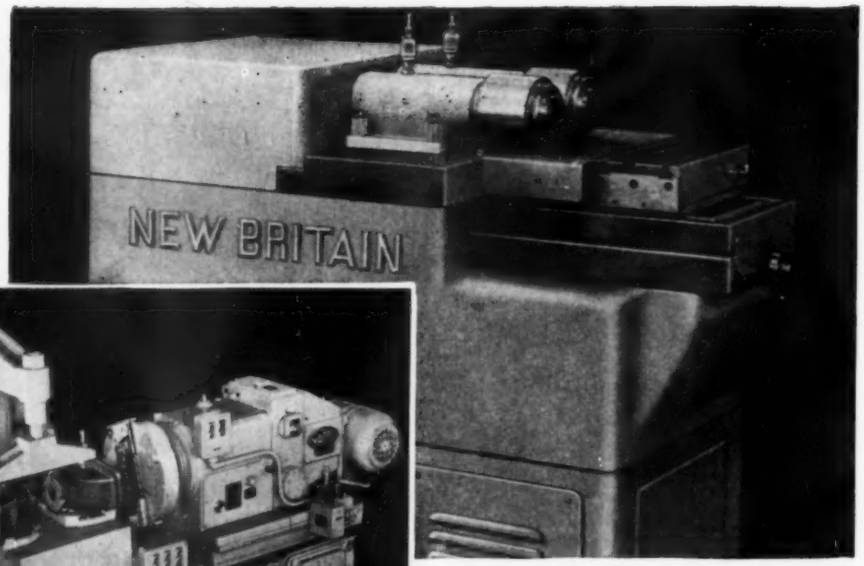
BORE-MATICS—*The Heald Machine Co., Worcester 6, Mass.* Double-end Model 122 (illustrated) and single-end Model 121, for small work are arranged to be operated from sitting position. They perform same type of work and are similar to Bore-Matic Models 222, 322, 221, and 321. Bridge width on both models is 16-in. Model 122 has 12-in. max. table travel and 2500-rpm. max. boringhead speed. Model 121 has 8-in max. table travel and 4000-rpm. max. boringhead speed.

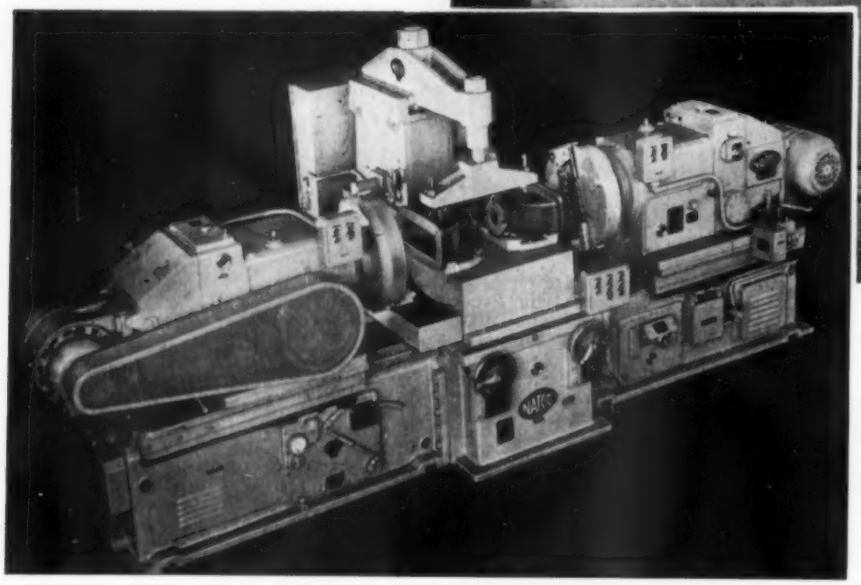


BORING—*Kearney & Trecker Corp., Milwaukee 1½, Wis.* Models B (shown) and C Autometric Precision boring machines are said to give three-dimensional accuracy of a type generally accredited to foreign equipment. Also developed are two precision machines for milling and boring, Models 3T and 3TT. →

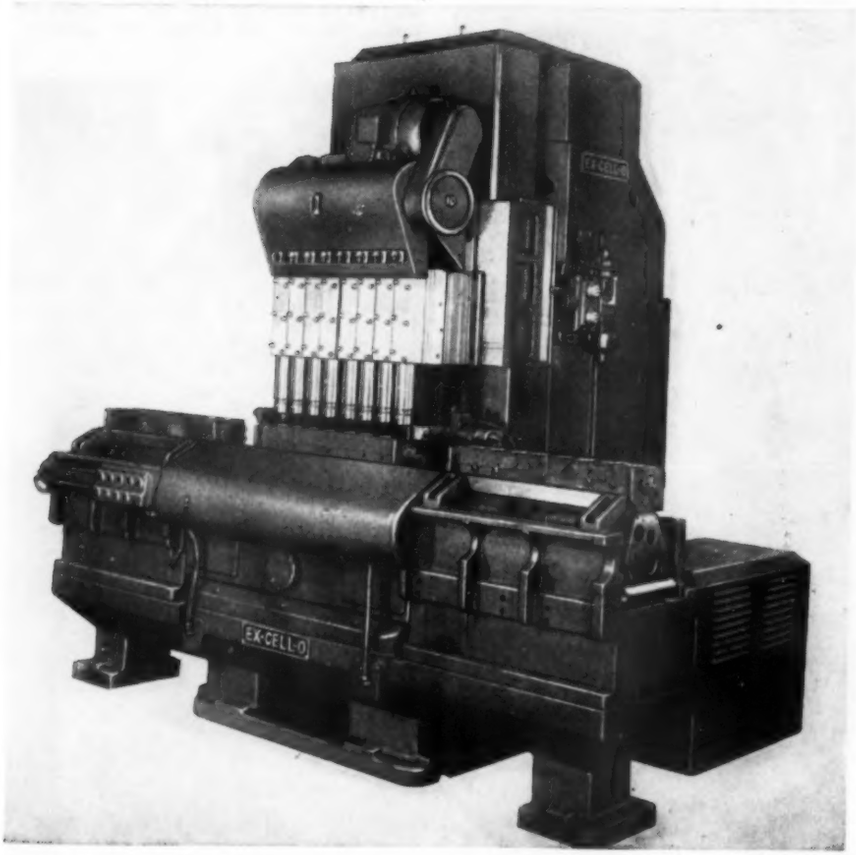
BORING

CONTOUR-BORING — *New Britain-Gridley Machine Div., the New Britain Machine Co., New Britain, Conn.* 26-36 and 27-37 machines have hand control. With two cams and a compound slide, it is possible to single-point turn or bore contours, radii, steps, angles, faces or other desired shapes. Tool may cut on either feed-in or drawback stroke. →

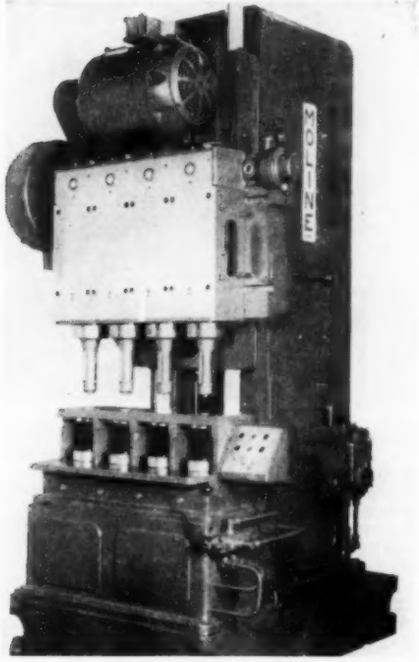




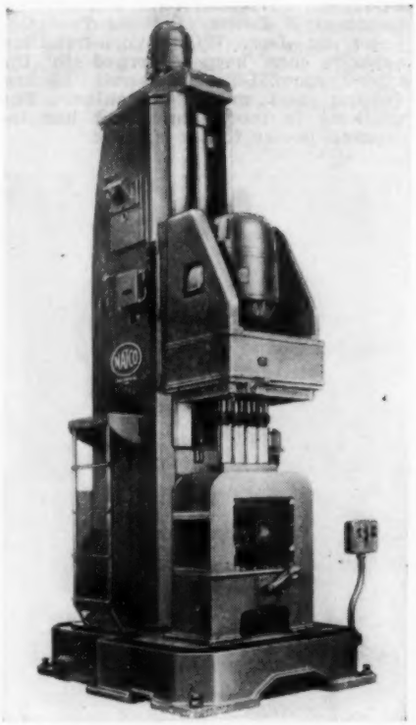
BORING, FACING—*National Automatic Tool Co., Inc., Dept. 20, Richmond, Ind.* The Natco A-20 Borface machine is designed to permit precision boring and facing of parts too large and awkward to handle or swing on boring mills and lathes. It can be used by semi-skilled operators. It consists of either A-20A or A-20B units mounted vertically, horizontally or at an angle to make up multi-way boring machines. Various types of workheads permit a combination of turning, boring, cross-facing, undercutting and ← other operations.



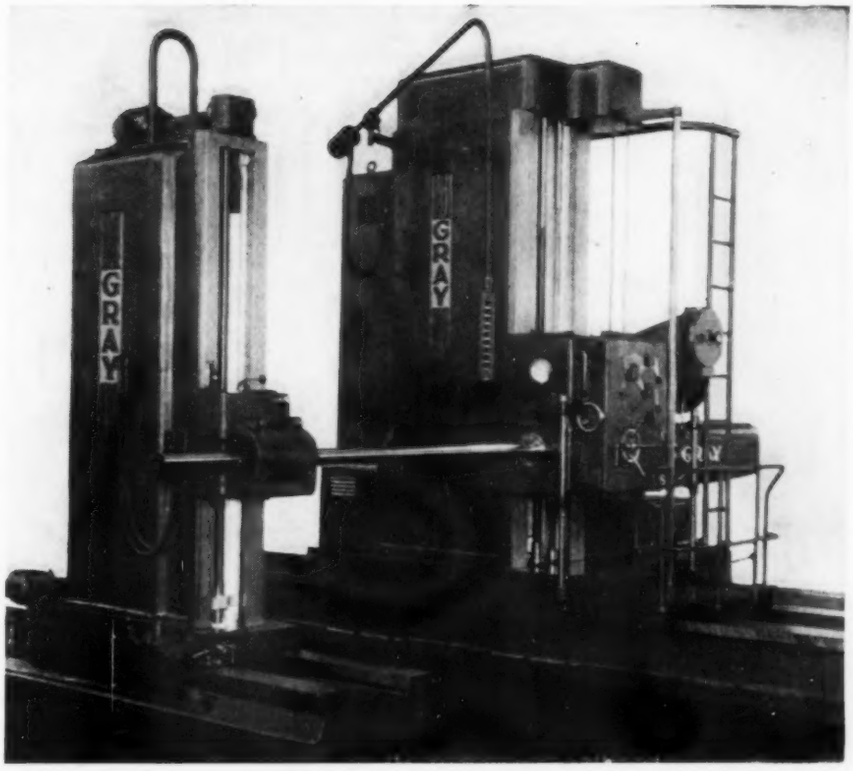
VERTICAL MACHINE — *Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Machine precision bores automotive cylinders. Handles in-line or straight-type engine blocks. The blocks move from conveyor line to suitable fixture on boring machine where they are positioned, clamped and bored. Known as Standard Style 66 Vertical Precision boring machine.



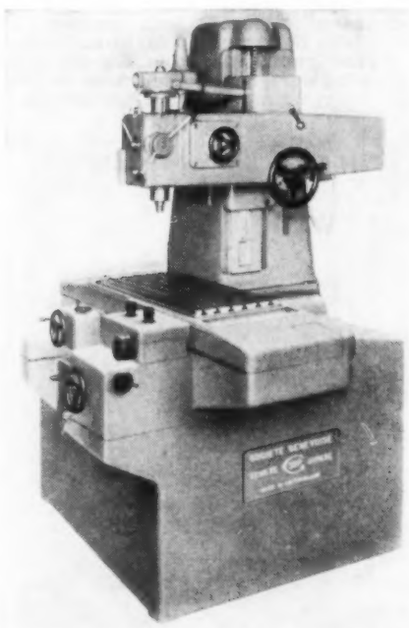
CYLINDER BORER—*Moline Tool Co., Moline, Ill.* A precision cylinder-boring machine, No. 115FB, equipped with four unpiloted spindles is equipped with automatic retracting boring heads. The single-point tools are retracted a few thousands of an inch when passed through work, allowing the tools to be withdrawn without shifting the work away from the tools and without stopping the rotation of the spindle.



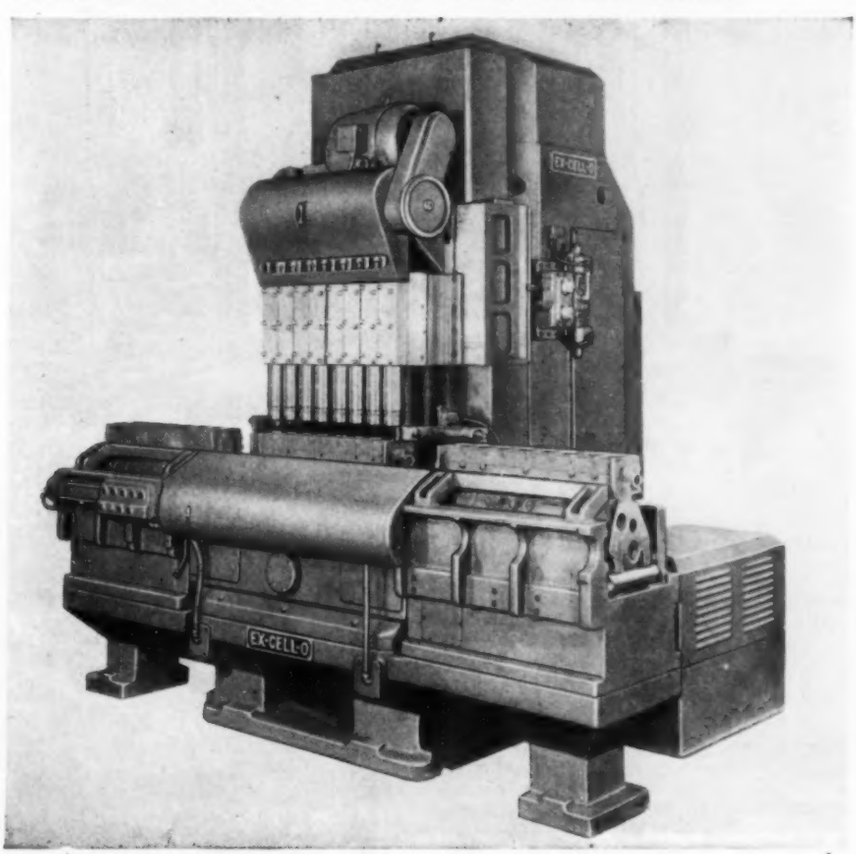
VERTICAL MACHINE—*National Automatic Tool Co., Inc., Richmond, Ind.* Natco Holesteel for cylinder-boring of replaceable sleeve liners is arranged with hydraulic feed, gear-driven head with four spindles. Unit handles cast-iron cylinder and crankcase at rate of 28 parts per hr. Rough and finish bores four cylinders after which it counterbores.



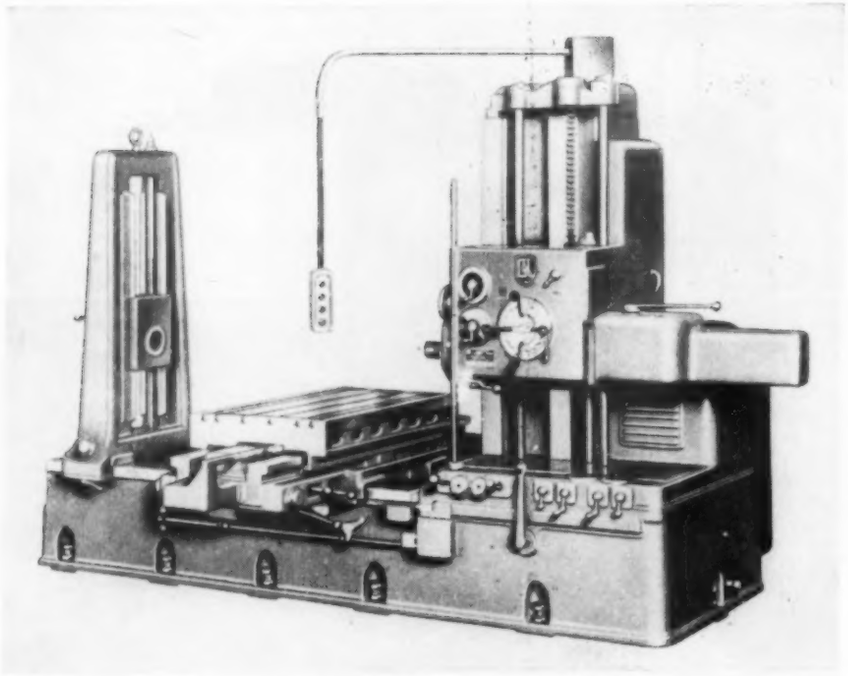
BORING MACHINE—*G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.* A 6-in., floor-type horizontal boring, drilling and milling machine, with a 40-hp. spindle motor, has 60-in. continuous bar travel, 72-in. vertical head travel on the column, 96-in. column travel on the runway, and 24-in. column cross-travel. Controls for head, column and spindle are centralized on a pendant switch which can be placed in any convenient position.



JIG BORER—*Distributed by Cosa Corp., 405 Lexington Ave., New York 17, N. Y.* The measuring system incorporated in the Hydroptic B has been extended to a smaller machine, the SP jig borer type MP-2H. Working surface is 27½x12½ in., with settings of table viewed by built-in micrometer microscopes reading to 0.0001 in.

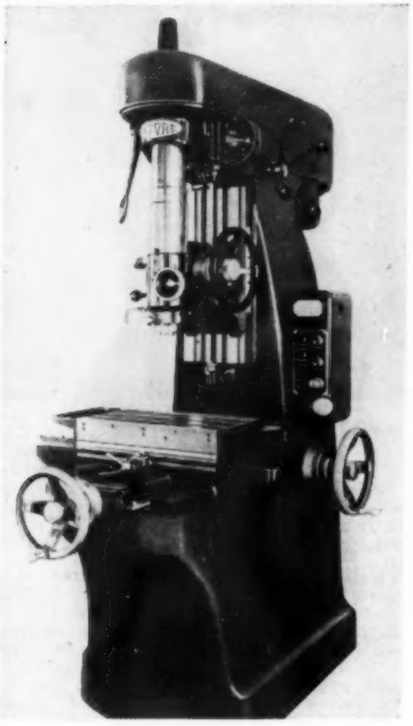


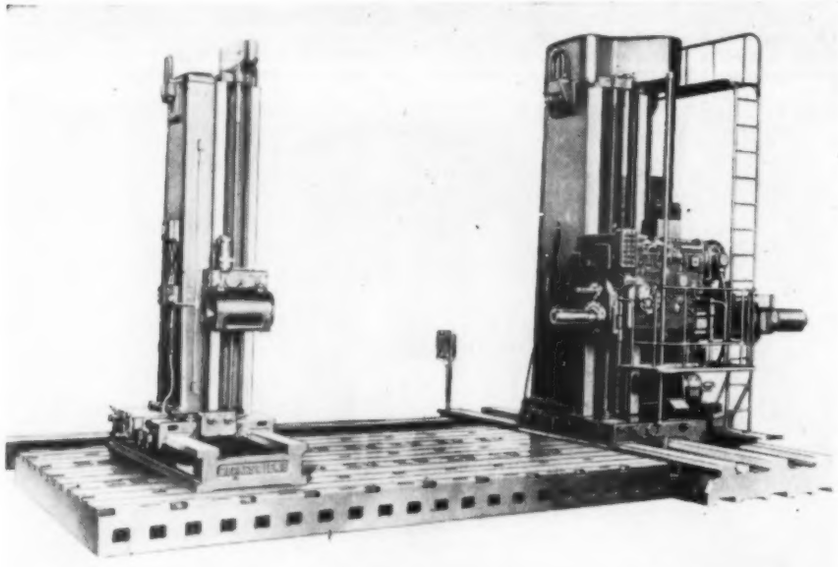
CYLINDER BORING — *Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Especially suited for automotive engine blocks, the Style 66 vertical precision cylinder-boring machine can be used for other boring operations where accuracy of roundness and straightness is required. Spindle slide is hydraulically operated and controlled either electrically or manually.



BORING, DRILLING, MILLING—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Medium-size Model 300-T horizontal boring, drilling and milling machine handles work to a 30-in. cube in size and 8,000 lb. in weight. The working range can be broadened by using rotary tables, continuous-feed facing heads, and other attachments.

BORING, DRILLING, MILLING—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Work-handling capacity has been enlarged in the table-type 351-T horizontal boring, drilling, and milling machine. The machine is more rigid and has increased power to the spindle.





JIG BORER—*Moore Special Tool Co., Inc., 740 Union Ave., Bridgeport 7, Conn.* The No. 2 jig borer is designed for rapid, precise table settings by means of accurate lead screws. It will bore holes up to 5 in. in mild steel or cast iron. The table has 10x19-in. working surface. Table travel is 16½ in. longitudinal, 10½ in. crosswise.

BORING, DRILLING, MILLING—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* This improved model handles large weldments and castings which makes it possible to bring hard-to-reach surfaces within range of the column, headstock and spindle travel. It is also available in table- and planer-type models.

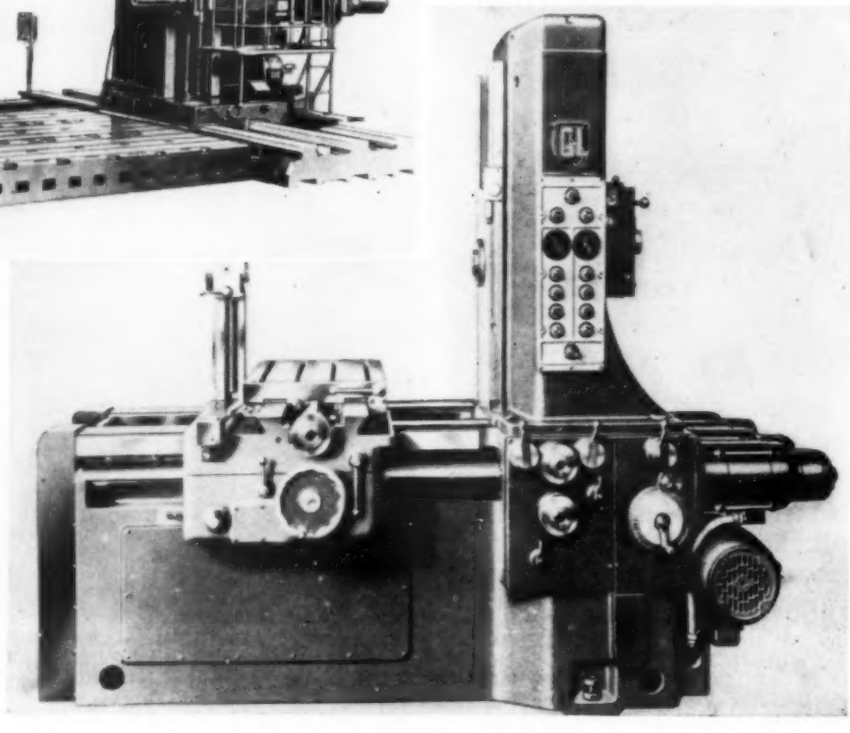
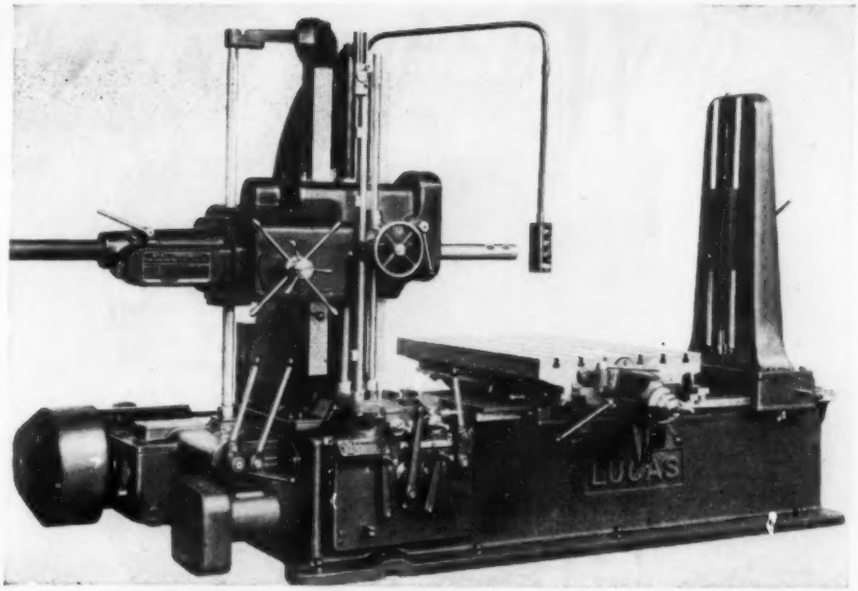
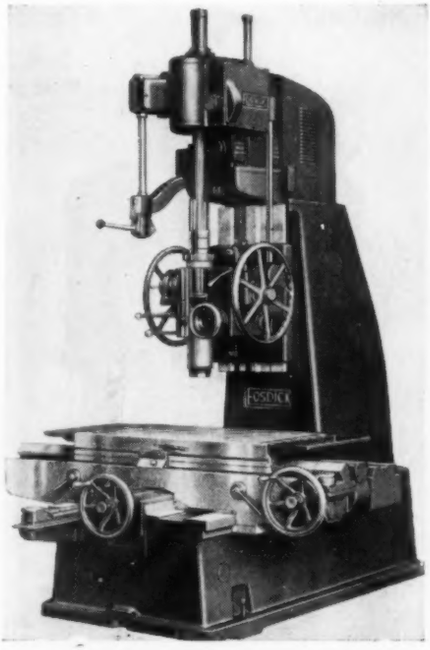


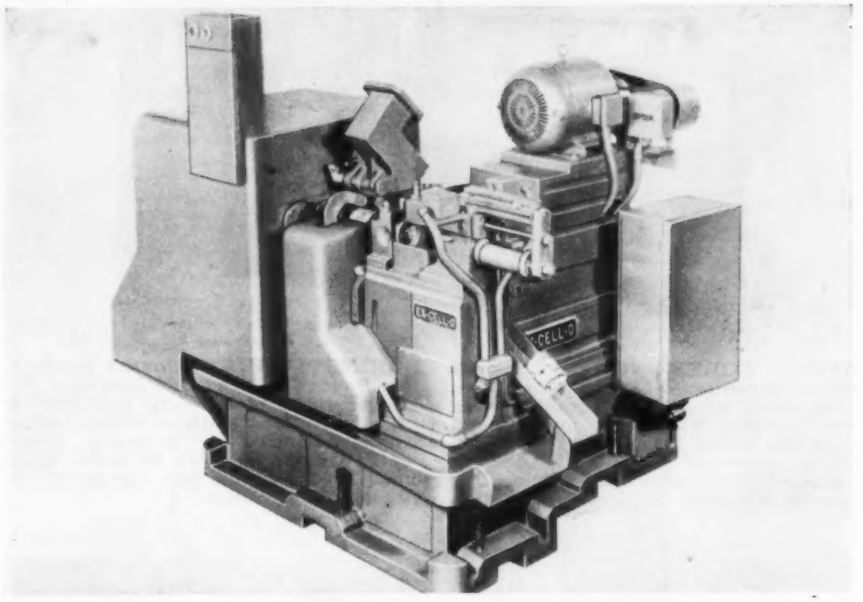
TABLE MODEL—*Giddings and Lewis Machine Tool Co., Fond du Lac, Wis.* A table-type Model 00-T horizontal boring, drilling and milling machine will accommodate work to 18-in. cube and 1,000-lb. weight. With the tracing attachment, it does die-sinking work such as plastic and die-casting molds and forging dies. With a thread-lead device it can be used for precision thread cutting. →

BORING, MILLING, DRILLING—*Lucas Machine Tool Co., Cleveland, Ohio.* Horizontal boring, milling and drilling machine, No. 41, has high-low speeds to the single 3-in. spindle, and electric pendant control for start, stop, reverse and jog. →

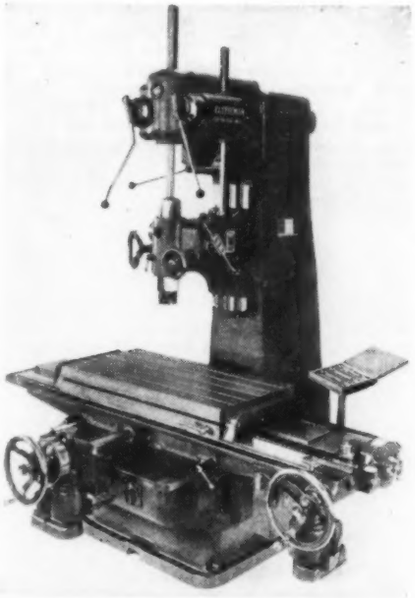




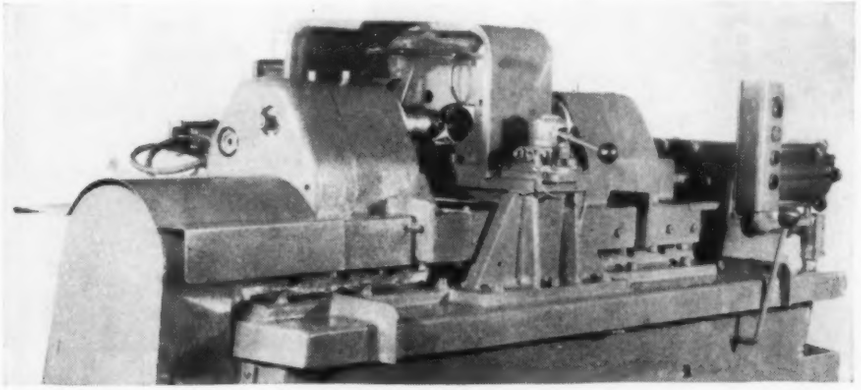
JIG BORERS—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Jig borers can be obtained with rapid power traverse to the table and slide. This mechanism is said to make it impossible to damage dial indicator or measuring rods. A single lever controls the nine feeds.



PISTON BORING—*Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 6, Mich.* Automatic machine receives aluminum pistons from a chute (with wrist pin holes as cast), finishes the holes, and ejects the pistons into a conveyor at the rate of one every 30 sec. Machine has two rough-boring tools and one finishing tool. Bores are held to 0.0003 in.

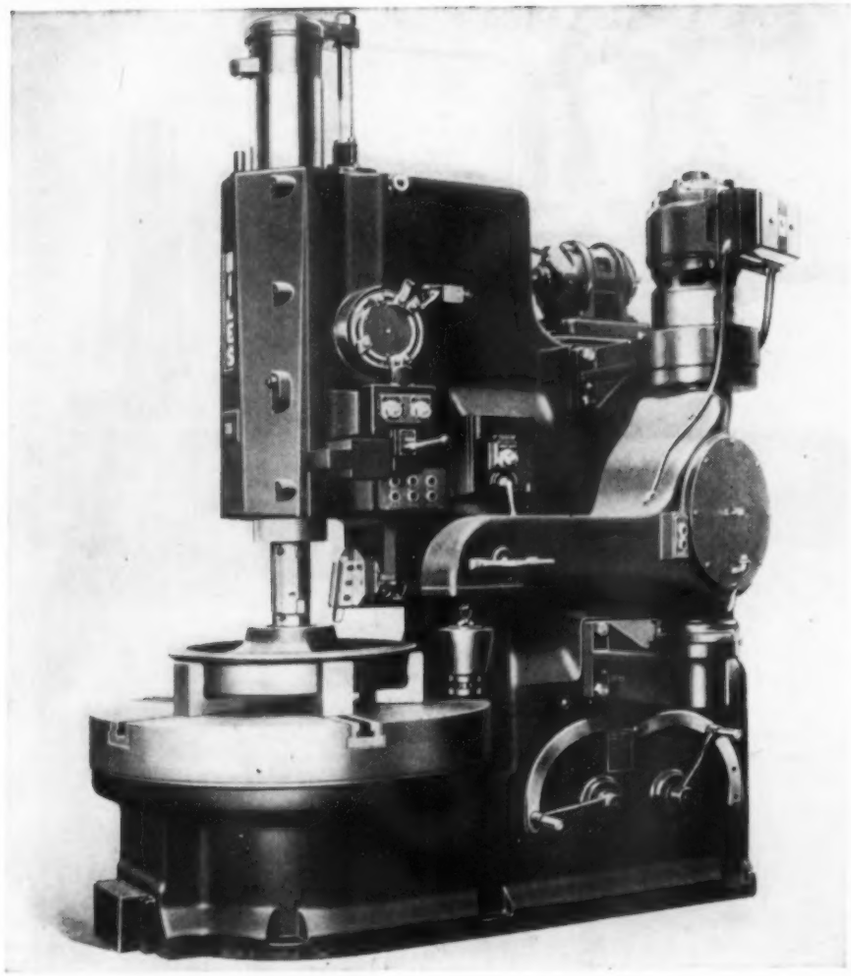


JIG BORER — *Cleereman Machine Tool Co., 400 W. Madison St., Chicago 6, Ill.* Power drive to the table by means of two electronically controlled motors in this jig borer provides prepositioning control, power traverse, and a full range of milling feeds. Power rapid traverse is 50 ipm.



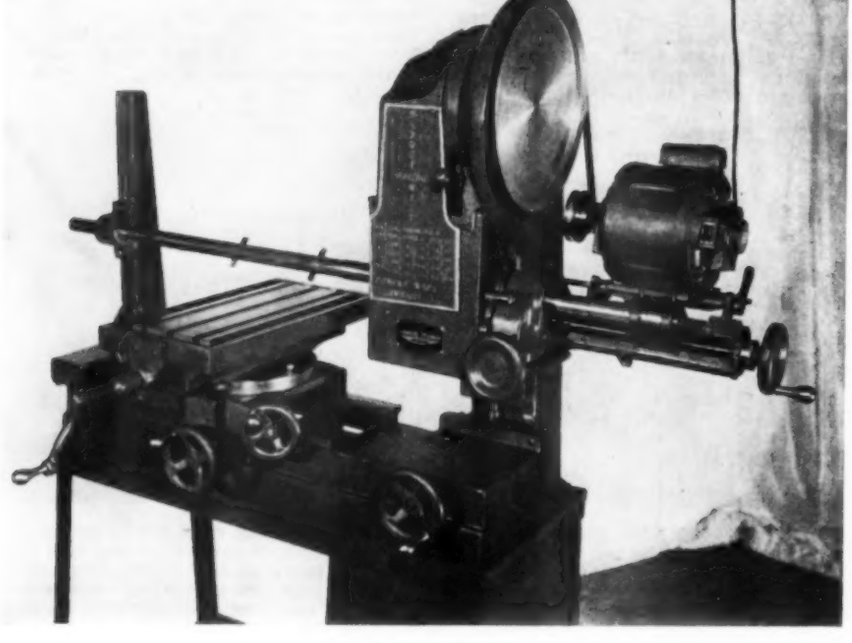
BORING MACHINE—*Bristol Machine Tool Co., 913 Wood St., Bristol, Pa.* Heavy-duty two-head boring machine takes up to three adjustable spindles in each head. Originally built to machine connecting rods for refrigerator compressors, it turns out one rod per 48 sec., performing two drilling operations, one rough-boring operation and two reaming operations.

BORING

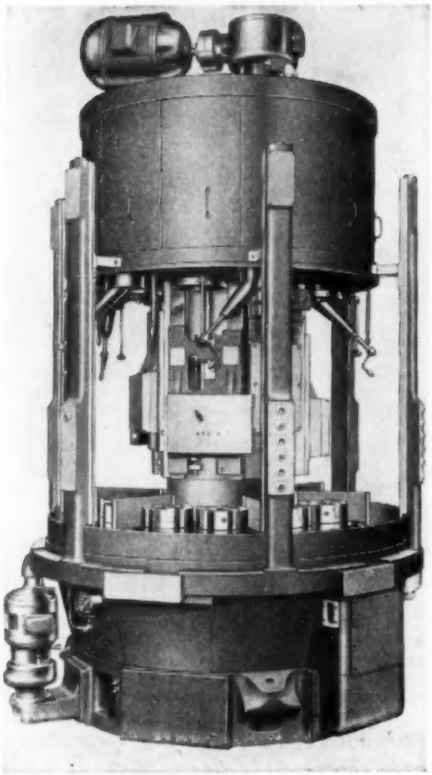


WHEEL BORER—*Niles Tool Works Div., Lima-Hamilton Corp., Hamilton, Ohio.* 48-in. automatic hydraulic borer has five-step automatic cycle. Feed dials can be set for most efficient feed for a particular speed and material. Three controls start the cycle. The bore is roughed, finished, chamfered.

BORING MACHINE—*Conrad Machine Co., Route 53 & Hoy Rd., Lombard, Ill.* Midget horizontal boring mill bench-type, is available with or without steel cabinet bench for handling small work. 16 speeds from 20 to 825 rpm. Feed is 0.005 in. per rev. Rotary table has hand feed only.



BORING MACHINE—*Lucas Machine Tool Co., Cleveland, Ohio.* A 4-in. spindle horizontal boring, drilling and milling machine, No. 460, has electric or electronic drive. The electronic machine may be operated from any position by pendant control. The electric touch system includes movement of the head, spindle, table and saddle. Both machines have a four-way bed. Distance between outside ways is 60 in.



MULT-AU-MATIC — *Bullard Co., Bridgeport 2, Conn.* Type K Mult-Au-Matic is a high-speed development of this standard multiple-spindle machine. The 15-ton, 6- or 12-spindle model has speeds from 100 to 900 rpm. The 21-ton, 8- or 16-spindle machine has speeds from 98 to 883 rpm. All models have 41 speed changes and 82 rates of feed.

MULTIPLE-HEAD MACHINE — *Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Model 340-MH, multiple-head machine, permits simultaneous operations on three sides of the work with four headstocks. Two opposing horizontal headstocks are mounted on two columns located on either side of the table. In addition, one or two vertical headstocks are mounted on a horizontal crossrail which moves on the column ways above the horizontal headstock.

PORTABLE BORING — *Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Model 230 portable machine performs precision boring, drilling, tapping, milling and facing on parts which cannot be moved to machine tools. Cutter may be approached to surfaces in almost any location.

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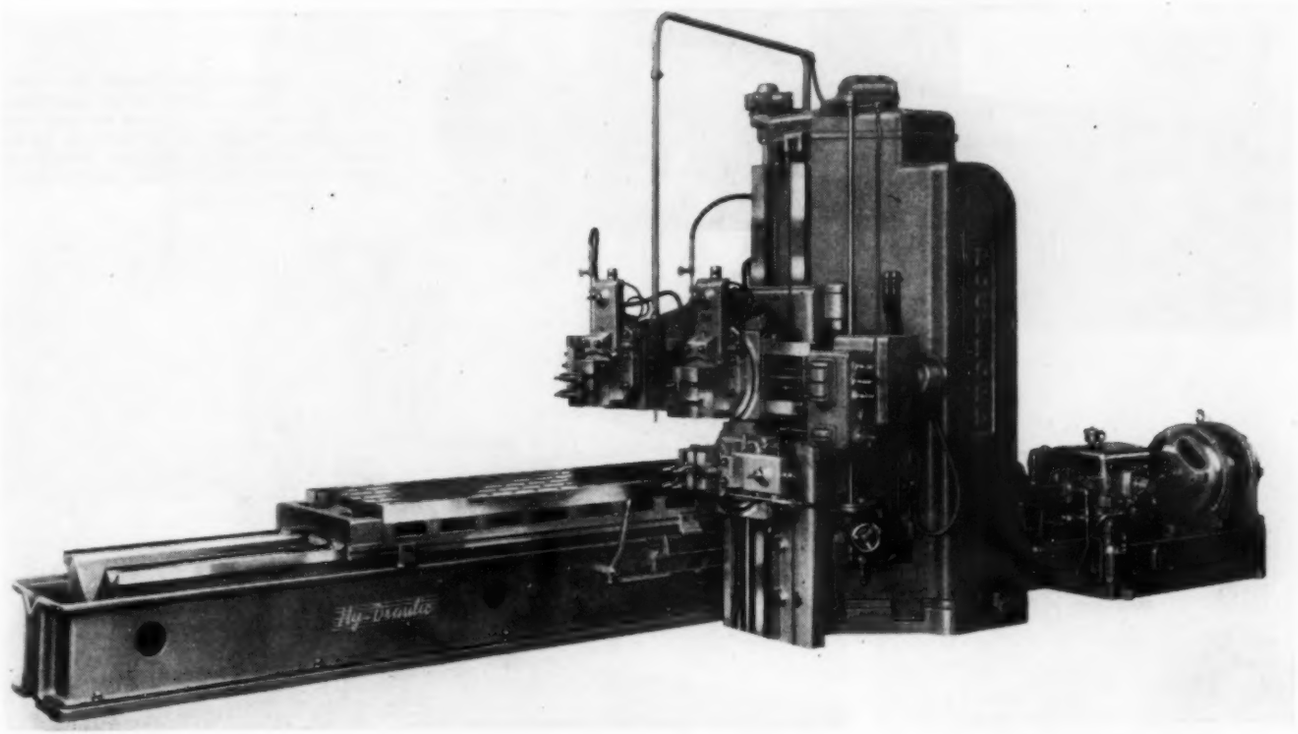
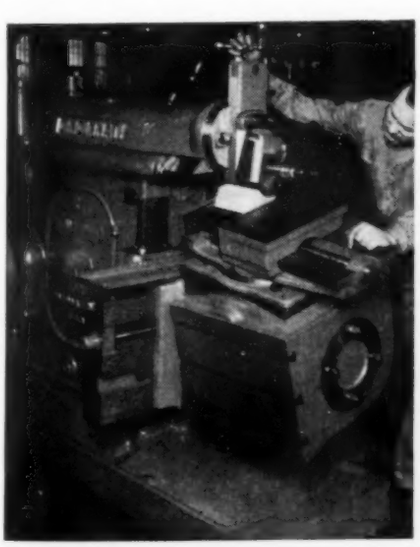
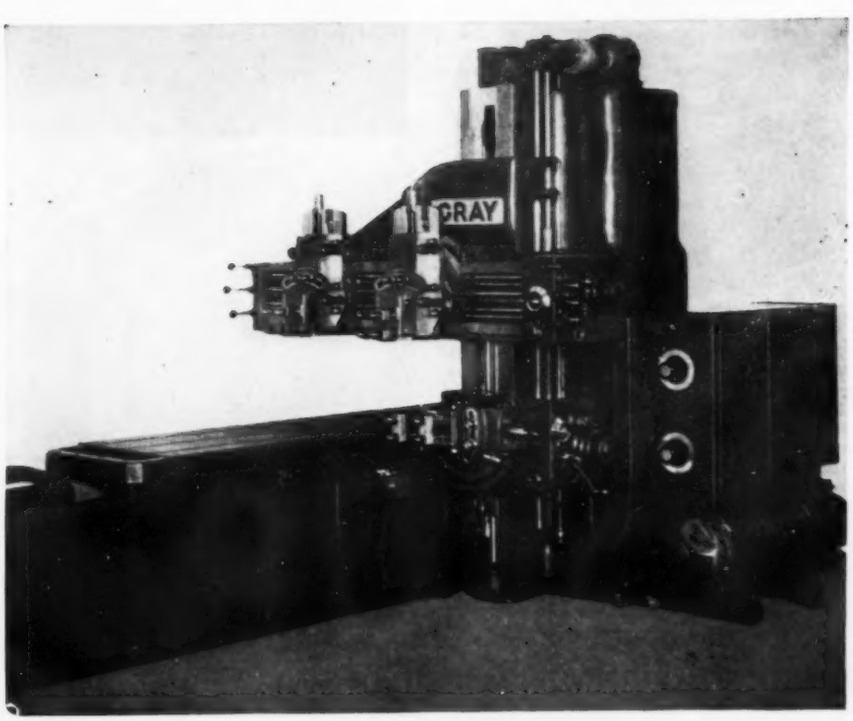
Planing and Shaping



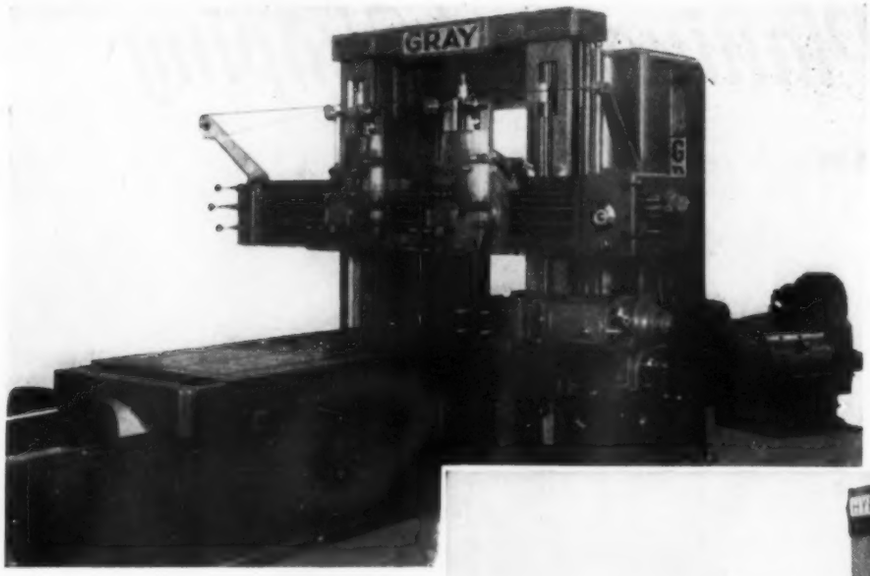
PLANERS—*Rockford Machine Tool Co., 2400 Kishwaukee St., Rockford, Ill.* Hydraulic planers, double housing and openside, have redesigned bed, table and column members. Heavier cross-section is provided for rigidity under all working conditions. Sizes available are 36x26 in., 42x42 in., 48x48 in. and 60x60 in.



SHAPER—*Cincinnati Shaper Co., Hopple, Garrard and Elam Sts., Cincinnati, Ohio.* Heavy-duty, 24-in. shaper has universal table. Shapers in this line have range from 16 to 36 in.

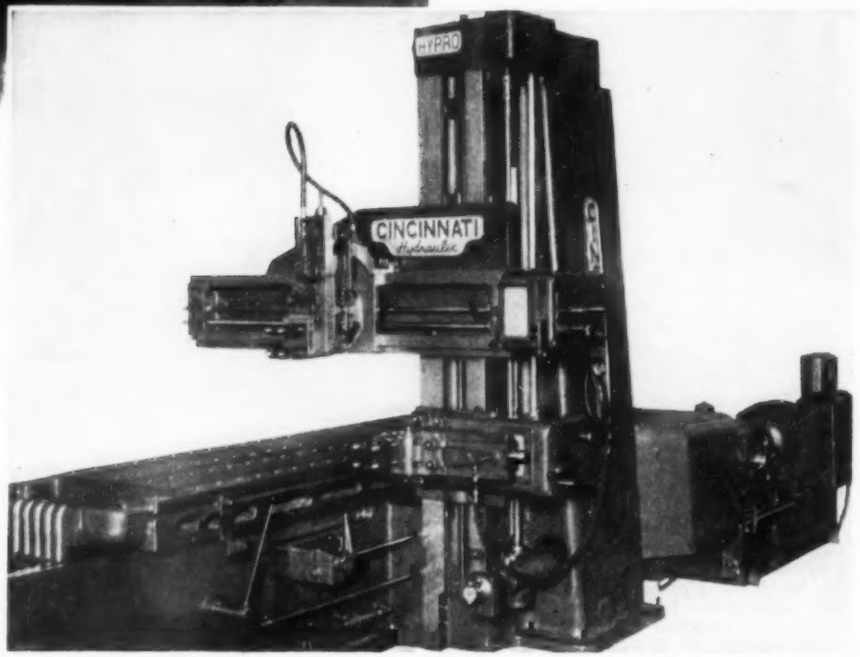


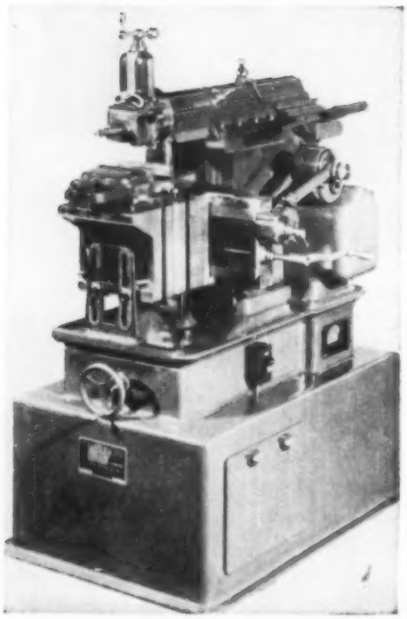
OPENSIDE PLANER—*The G. A. Gray Co., Cincinnati, Ohio.* The Gray Openside Planer Cub, in 24-, 30- and 36-in. sizes, is equipped with the Space Saver Drive. The 30-in. size (illustrated) has 8-ft. table. The motor is mounted at an angle alongside the column and drives through a full-floating shaft and hypoid gearing. Speeds up to a maximum of 300 fpm. make possible the use of carbide tools. To replace the table, if it runs off the bull gear, a Synchro-Mesh Table Replacer is provided.



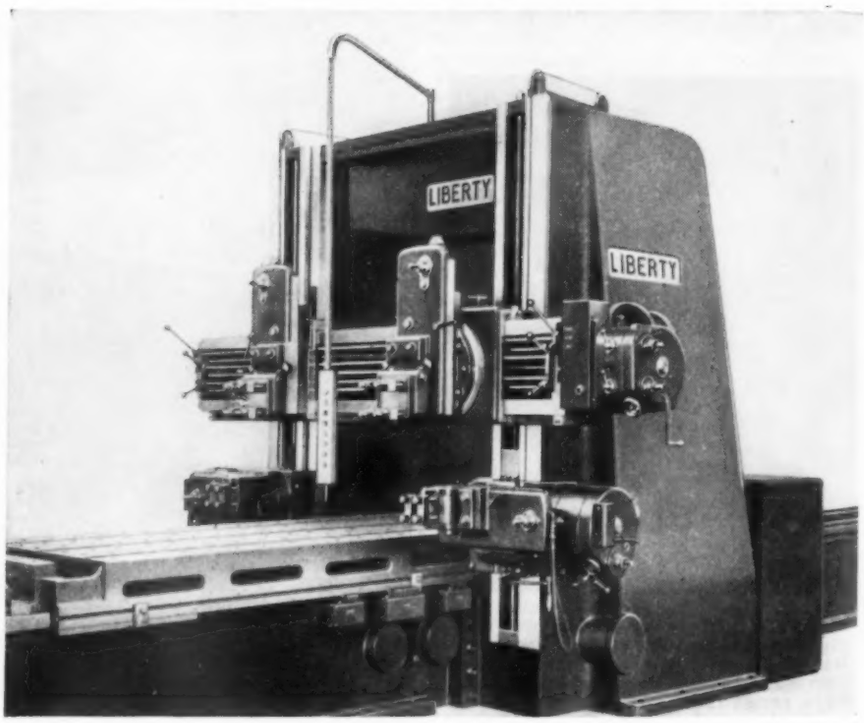
DOUBLE-HOUSING PLANER—*G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.* Unit is 42x42 in. x 10 ft., will run at 300 fpm. A 35-hp. variable-voltage main drive motor drives the table through Space-Saver ← drive.

PLANER—*Cincinnati Planer Co., Cincinnati 9, Ohio.* Hydraulic openside planer, 30 in. x 8 ft. size is for the small planer field. It is driven by a hydraulic unit with Hypro fingertip remote control for infinite adjustment of table speed. ↓

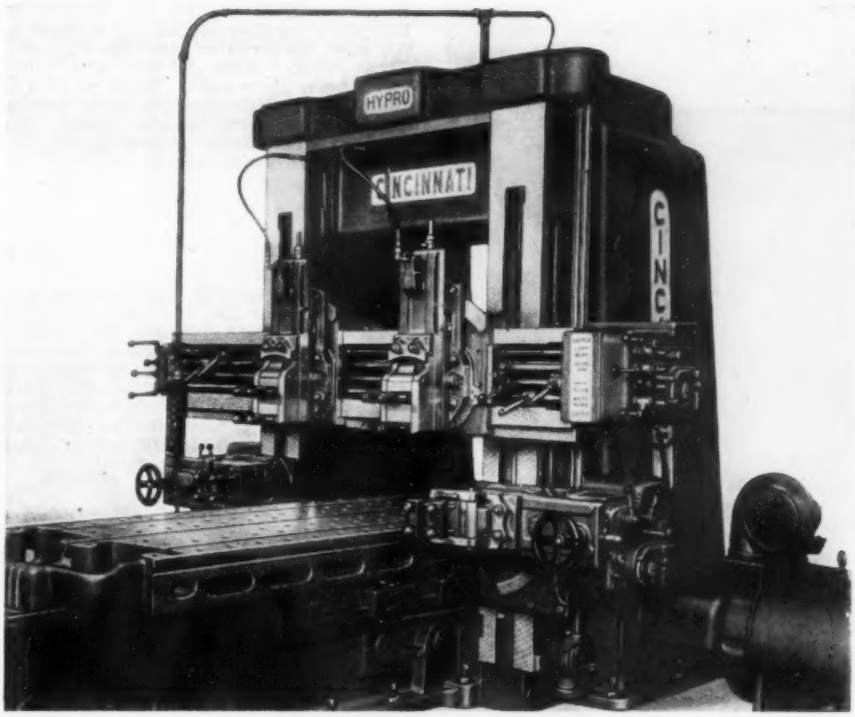




SHAPER—*Sheldon Machine Co., 4250 N. Knox Ave., Chicago 41, Ill.* A 12-in. precision backgeared shaper follows the design of toolroom shapers. A variable-speed motor provides all speeds from 12 to 180 strokes per min., and is adjusted by a hand-wheel. Automatic crossfeeds in both directions are from 0.0025 to 0.0175 in.

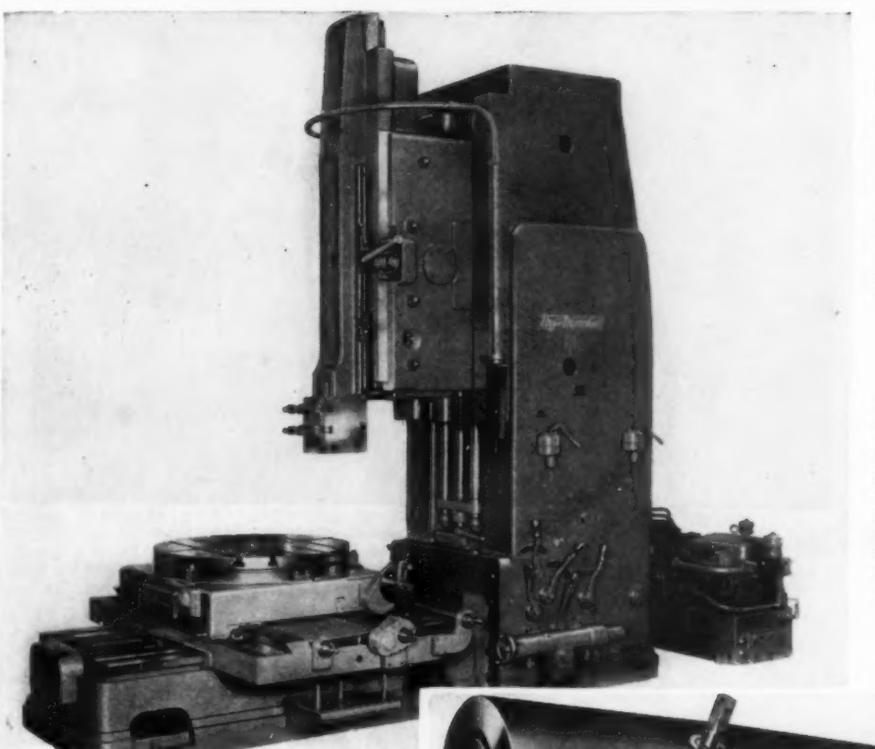


HEAVY-DUTY PLANERS — *Liberty Planers, Inc., Hamilton, Ohio.* Redesigned planers with electrical controls for heavy-duty operation have table driven by variable-voltage drives at speeds up to 300 fpm. Rail- and sideheads are independent units, each with its own electric motor. A pendant station provides a central control point. 60-in. double-housing planer with side-head is illustrated. →

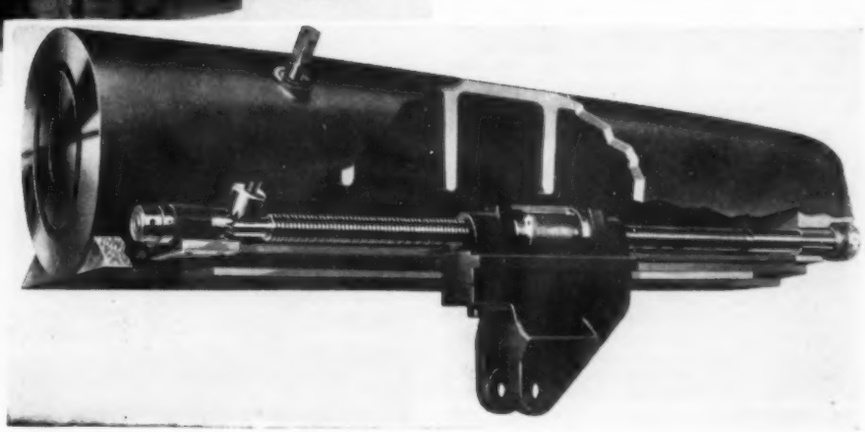


PLANER—*The Cincinnati Planer Co., Cincinnati 9, Ohio.* An improved variable-voltage motor drive is incorporated in the double-housing planer. Model illustrated is 48 in. x 48 in. x 16 ft. New mechanical features include a positive magnetic clutch-type quick-acting feed mechanism. ←

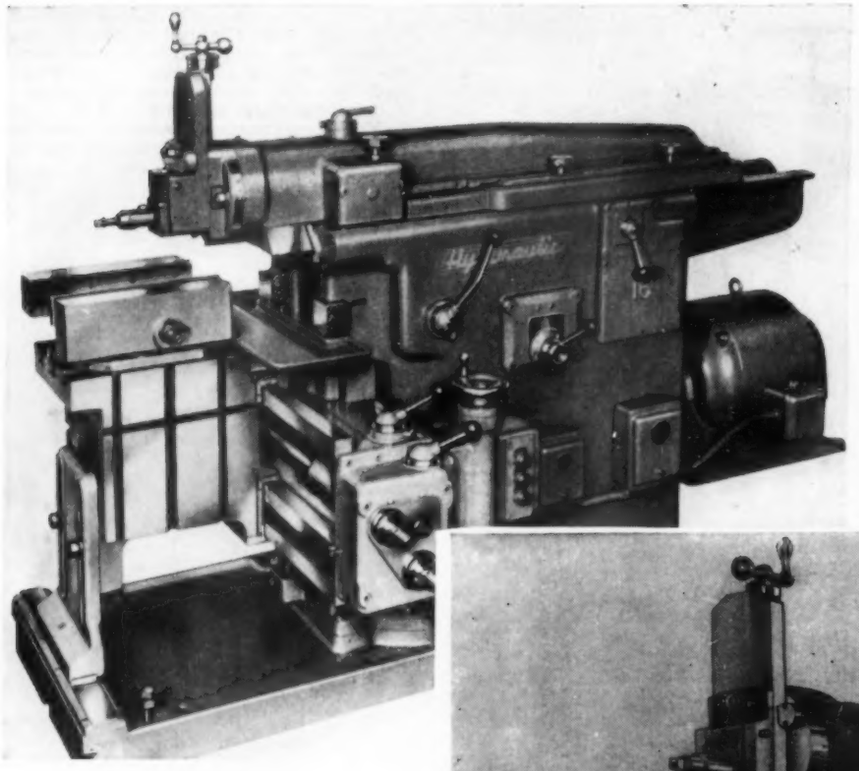
FLASH-TRIMMING — *Morton Mfg. Co., Muskegon Heights, Mich.* A flash-trimming machine for removing the flash or upset from resistance or butt welds is built in sizes from 8 to 12 in. of trimming capacity and ⅛-in. metal thickness. Work is placed over lower horn, and operator steps on pedal. The ram trims on the drawcut or inward stroke



SLOTTERS—*Rockford Machine Tool Co., 2400 Kishwaukee St., Rockford, Ill.* 36- and 48-in. stroke-size Hy-Draulic slotters have a ram which can be set for travel in a tilted plane, when work requires, with adjustment at any angle between vertical and 10° forward. Longitudinal, transverse and rotary table feeds are provided. The units incorporate infinite speed adjustment and high stroke speeds. ←

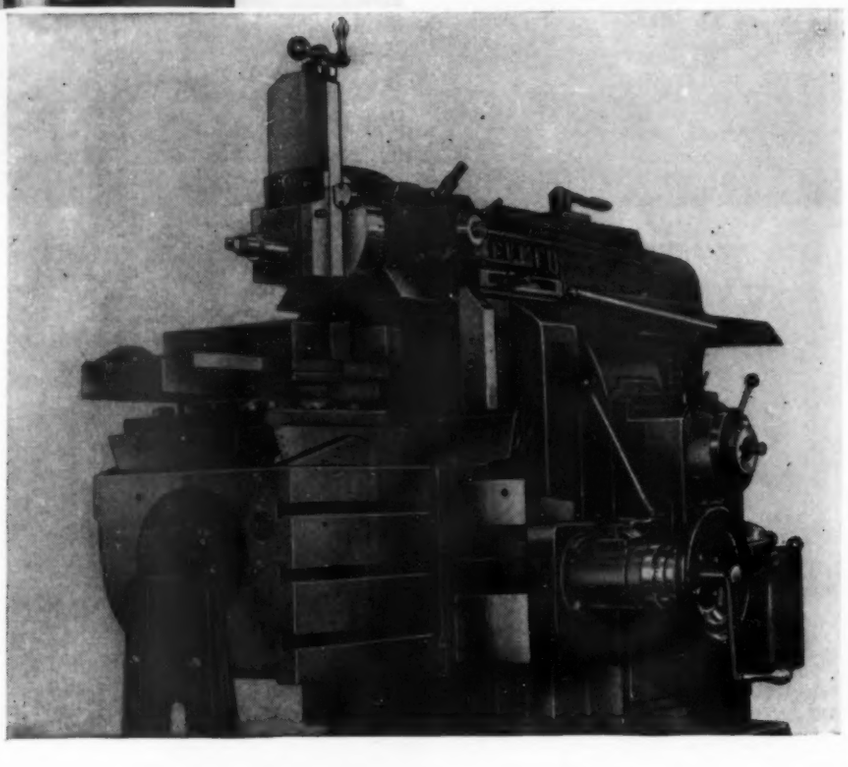


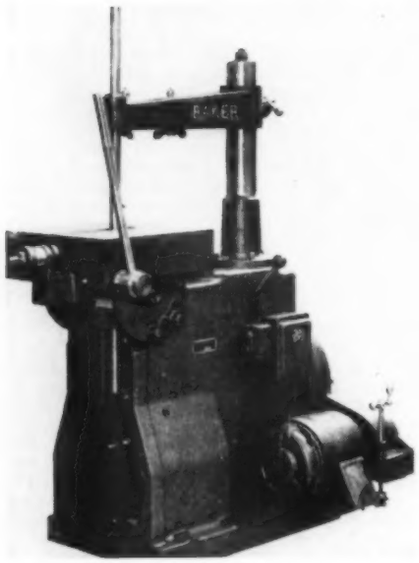
CRANK SHAPERS—*Smith & Mills Co., 2889 Spring Grove Ave., Cincinnati 25, Ohio.* An improved ram, for line of 12-, 16-, 20-, 25-, 28-, and 32-inch crank shapers, eliminates the slot which was formerly necessary for the ram-position locking stud. This adds to the strength of the ram without increasing the weight. In addition, the new ram has a self-locking ram position feature. To position the ram the operator turns the shaft located on the top of the ram. →



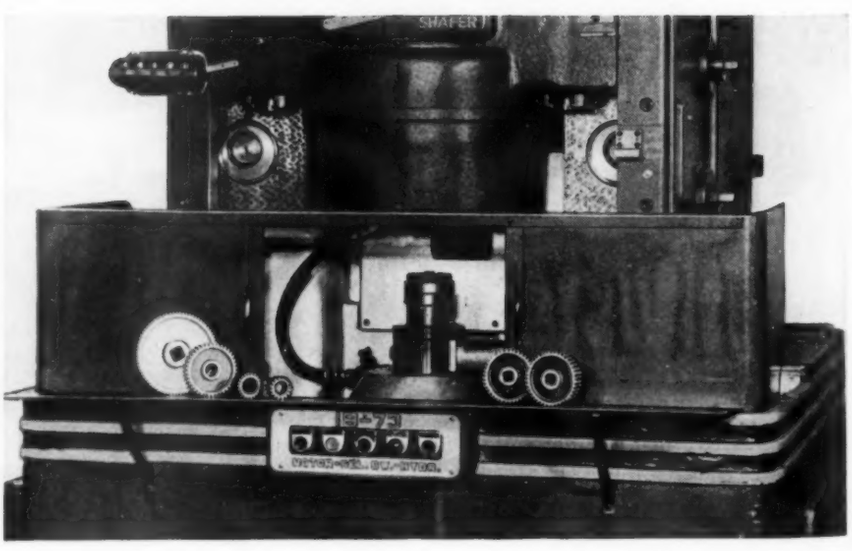
SHAPERS—*Rockford Machine Tool Co., 2400 Kishwaukee St., Rockford, Ill.* More rigid construction is used in the new Hy-Draulic ram-type shapers. Cross-section sizes of rail and table have been increased. Built in 12-in., 16-in., 20-in., 24-in. special, 24-in. heavy-duty, and 28-in. stroke sizes, the shapers also have improvements in ← the hydraulic circuit.

SHAPERS—*General Engineering and Manufacturing Co., 4417 Oleatha Ave., Dept. AM, St. Louis 16, Mo.* Gemco multi-purpose shapers have been improved. A gear-shifting system provides four-way control of feeds. Both the oil pump and filter are now placed on the side of the column so they can be removed without disturbing pipe connections. ↓



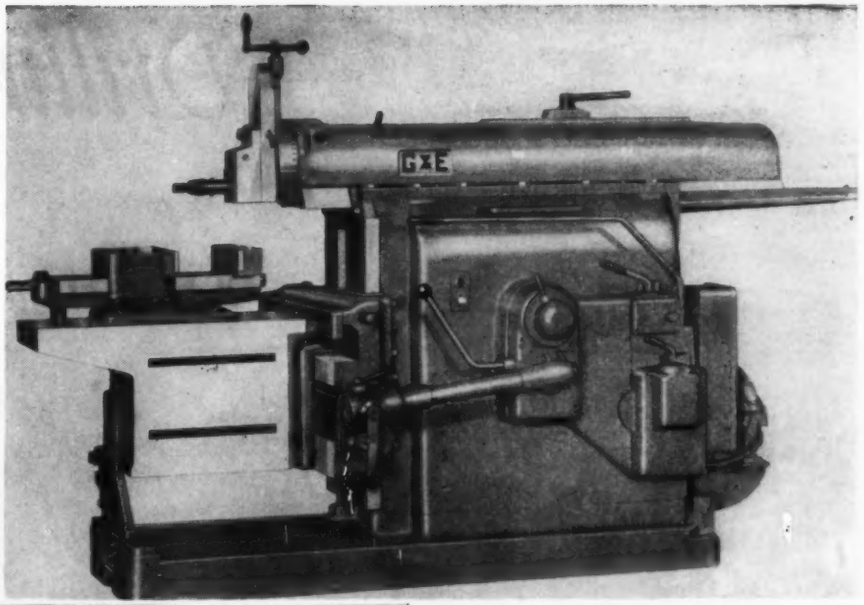


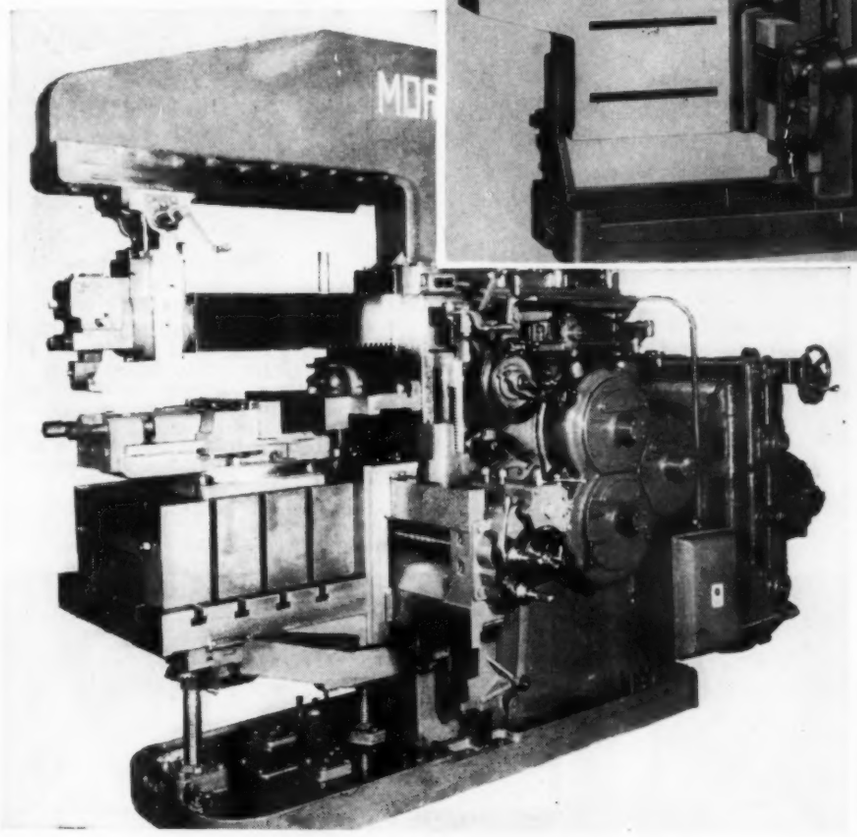
KEYSEATER—*Baker Brothers, Inc., Box 101, Station S, Toledo 10, Ohio.* Model 0 will cut keyways in mild steel up to 9 in. long by 1 in. wide at a feed of 0.005 in. Operating on the drawcut principle, the tool is held in a reciprocating bar.



SHAPER—*Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.* Shear-Speed shaper line, used for cutting gears, is now said to cut almost any external shape which can be produced "internally" by broaching. The shapes are cut by formed tools which feed in radially from all sides. Parts up to 10-in. dia., and 2¾-in. face width can be handled. →

OPENSIDE SHAPER—*Rockford Machine Tool Co., 2400 Kishwaukee St., Rockford, Ill.* A redesigned column and other changes have been made in the 36-in. Hy-Draulic openside shaper. The new column is extremely heavy in cross-section. Power rail elevation is offered as extra equipment. Controls for all major table movements are in duplicate, mounted on each side of the bed.

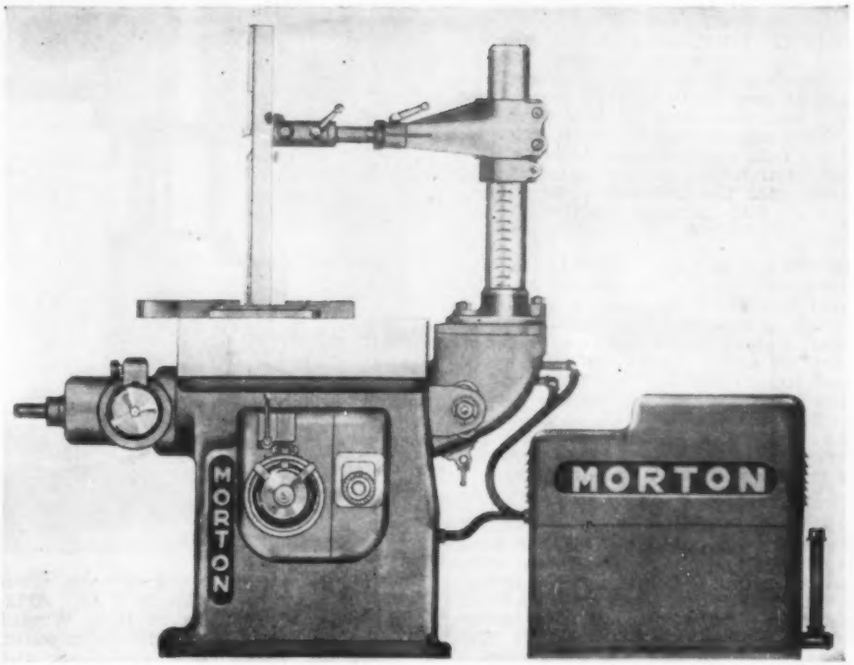




SHAPERS—*Gould & Eberhardt, Inc., Irvington 11, N. J.* New G&E developments incorporated in shapers include 16 ram speeds and all-helical gear drives. The 16 speeds, arranged in geometric progression, are selected by two gearshift levers. The ram on the industrial shapers (the 32-in. size is illustrated) has been made wider and strengthened to minimize deflection. Dial feed provides 18 changes with a range of fine or standard feeds.

SHAPER-PLANER — *Rockford Machine Tool Co., 2400 Kishwaukee St., Rockford, Ill.* A Hy-Draulic Shaper-Planer is designed to combine speed and rigidity. A dual-cylinder assembly, installed as extra equipment, provides cutting speeds up to 240 fpm. Cutting and return stroke speeds are infinitely adjustable and may be set independently.

DRAW-CUT SHAPER—*Morton Mfg. Co., Muskegon Heights, Mich.* A 32-in. stroke high-duty draw-cut shaper is designed for light- and heavy-duty shaping and planing. It has rapid power traverse and automatic feeds for horizontal and vertical movements. There are 30 in. of horizontal or side feed and 16 in. of vertical feed.



KEYWAY CUTTER, SLOTTER—→ *Morton Mfg. Co., Muskegan Heights, Mich.* A hydraulically driven keyway cutter and slotting machine is made in 18 and 24 in. stroke sizes. The top plate has six T-slots for securing the attachment which holds down work. Taper is secured by tilting the cutter bar. Tapers up to ½ in. per ft. forward or 1 in. per ft. backward can be set. Cutting-speed range is 10 to 25 fpm. with quick-return speed of 75 fpm.

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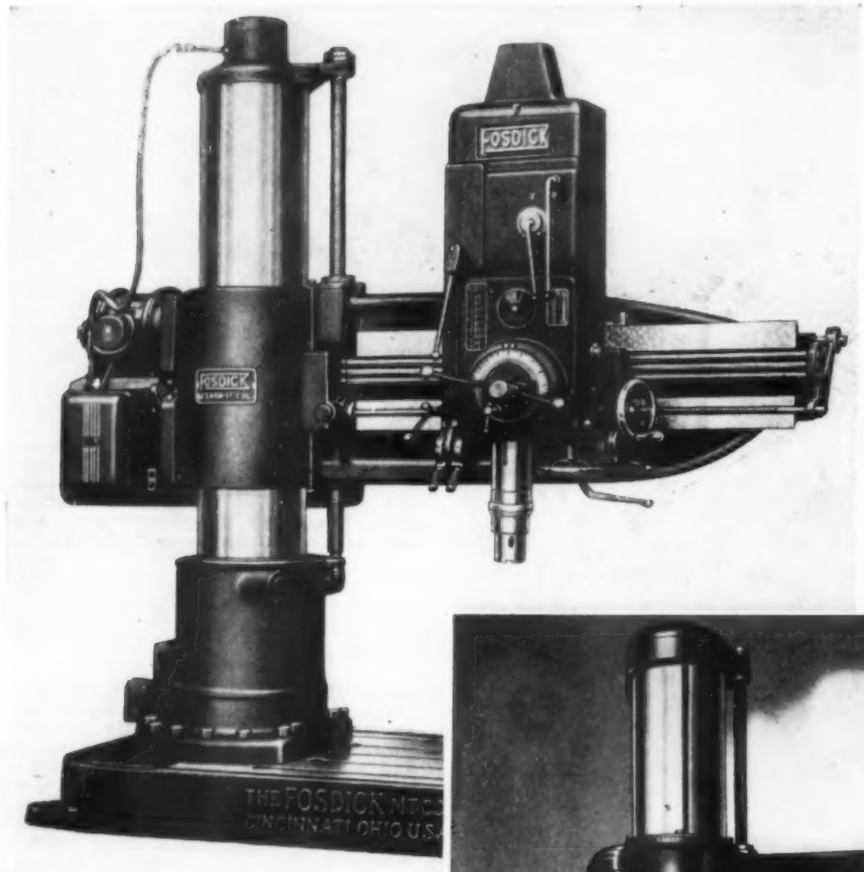
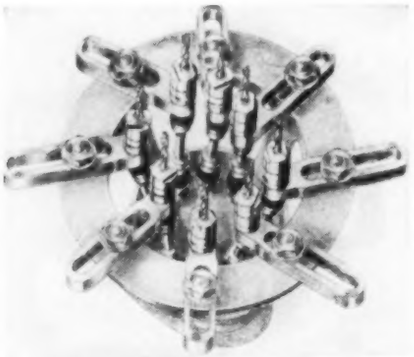
Drilling



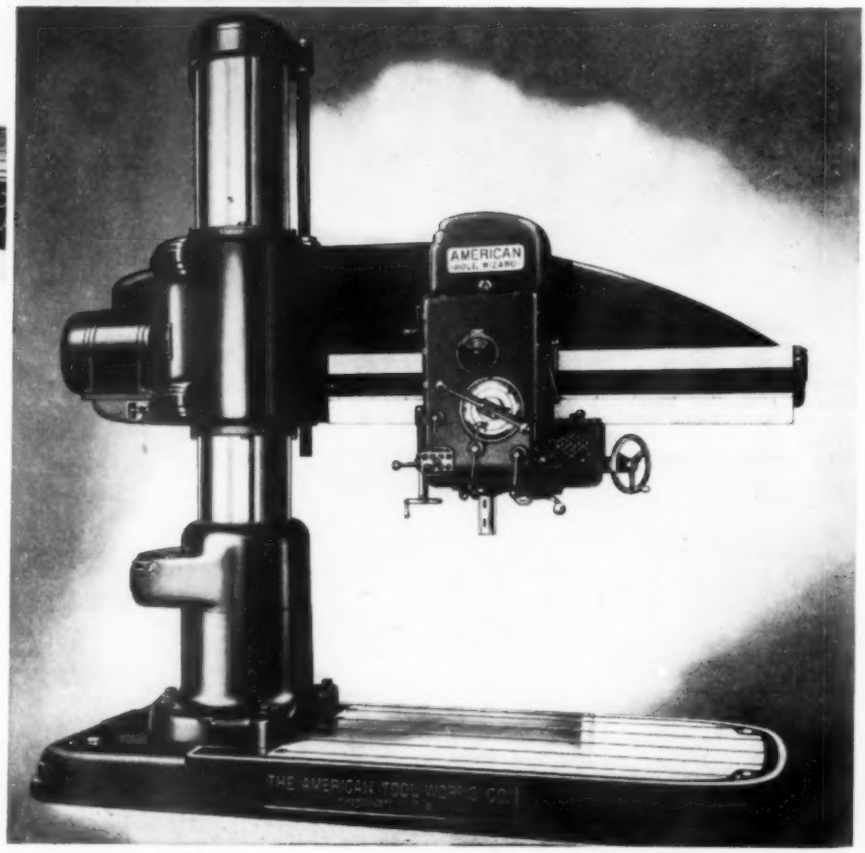
RADIAL DRILLS—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Radial drills with 13- to 19-in. columns have several new features. To reduce set-up time, clamping of the head and column are interlocked with engaging of the feed mechanism. A tool ejector has been added which automatically disengages the tool when the spindle is moved to extreme position.

LIGHT RADIAL DRILL—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Drill has 11-in. column, is similar in design to standard line of radial drills. Arm is elevated by a motor placed on back of Arm. There are nine speeds and four feeds in the head with a speed ratio of 20:1. Speeds as low as 60 rpm. and as high as 3500 rpm. are obtainable. Semi-automatic tapping control is available. The machine is built with 3-, 4- and 5-ft. arms.

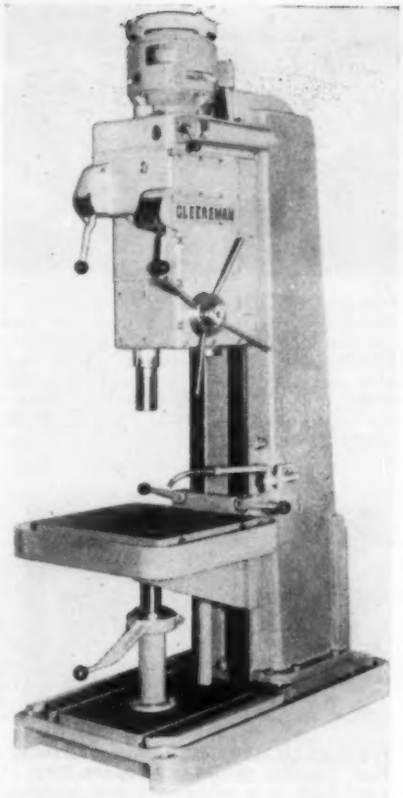
RADIAL DRILL — *Fosdick Machine Tool Co., Cincinnati 23, Ohio.* A sensitive radial drill has a fixed arm which can be swung 360° and a movable table which moves up and down on a round column. Table can also be swung 360°. The one-piece column is 12-in. dia. at bottom and 8½ in. at top.



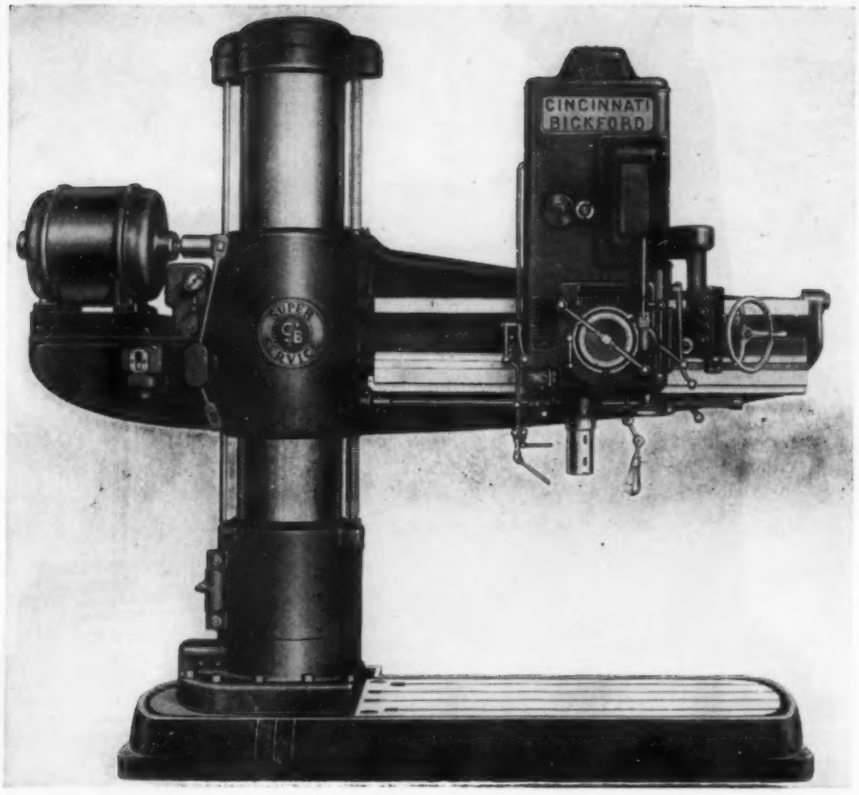
ADJUSTABLE DRILLHEAD—*Commander Mfg. Co., 4225 W. Kinzie St., Chicago 24, Ill.* The Multi-Drill, an eight-spindle adjustable drillhead, can be attached to any drillpress and will drill eight holes at one time in any hole pattern within a 9-in. circle to a minimum center distance of ½ in.



RADIAL DRILL — *American Tool Works Co., Cincinnati 2, Ohio.* Arm-elevating mechanism on Hole Wizard radial drill now has automatic oiling provision which oils elevating and safety nut automatically each time arm is elevated. Arm girdle which fits the column sleeve has automatic oiling and wipers. Size illustrated is 5 ft. 15 in.



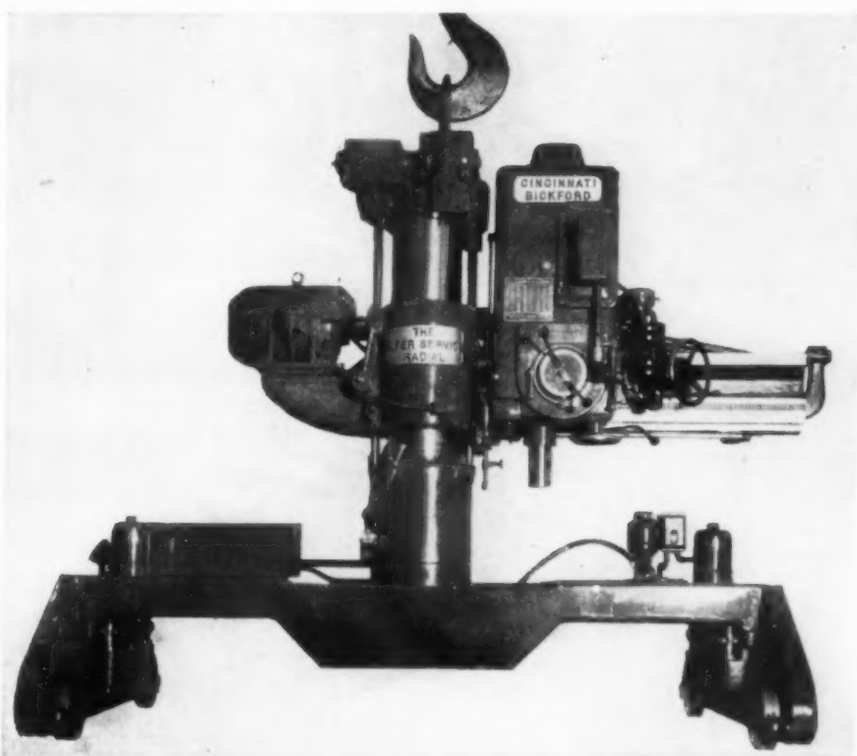
UPRIGHT DRILL—*Cleereman Machine Tool Co., 400 W. Madison St., Chicago 6, Ill.* Model 325 single-unit upright drilling machine has a fully inclosed sliding head which includes not only the spindle and feed mechanisms, but also the motor and spindle-speed transmission. Multiple units can be obtained in combinations of two to six spindles, or more.



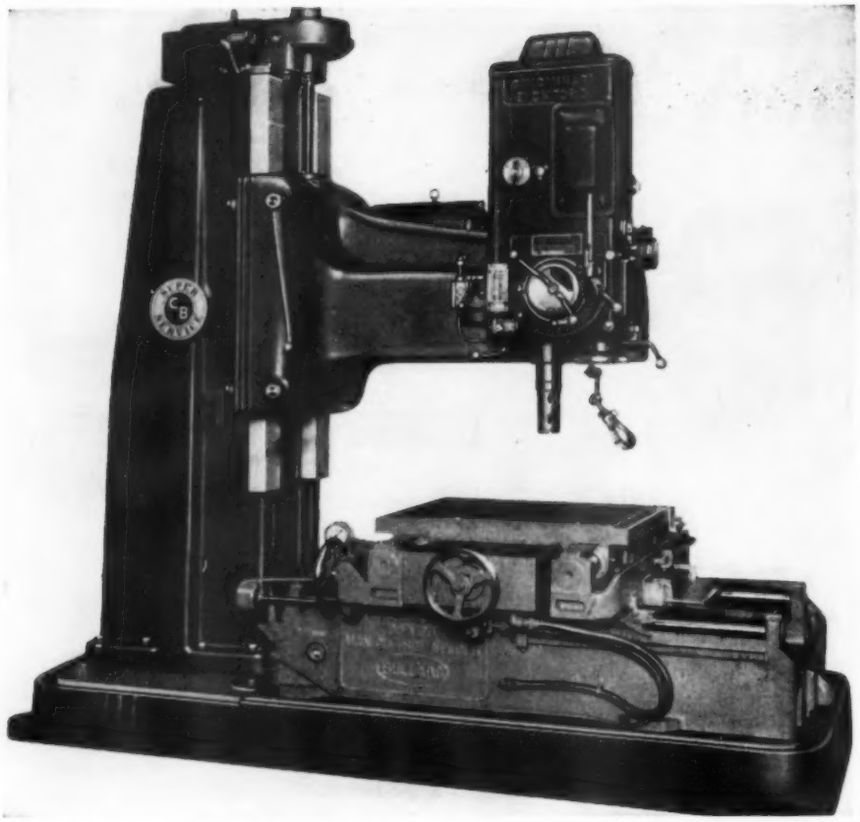
RADIAL DRILL—*Cincinnati-Bickford Tool Co., Oakley, Cincinnati 9, Ohio.* 17-in. dia. column Super Service radial drill has hydraulic arm and column-clamping mechanism. It has 18 feeds and 36 speeds. (Illustrated above.)

RADIAL DRILL—*Cincinnati-Bickford Tool Co., Oakley, Cincinnati 9, Ohio.* Simplified radial drill with 11-in. dia. column, hydraulic arm and column clamp has 12 speeds and 6 feeds, with all controls located at head.

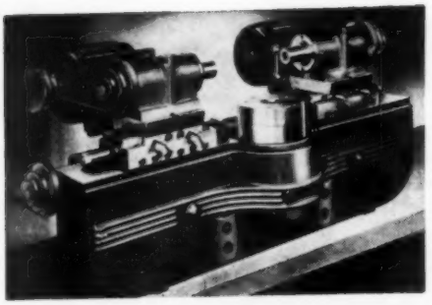
DRILLING, TAPPING UNIT—*Kaukauna Machine Corp., Kaukauna, Wis.* Portable or stationary horizontal drilling and tapping machine has a tilting horizontal head for unlimited number of operations. Machine spindle can be placed in virtually any position. Listed as No. 1030, unit has a fine feed to spindle through micrometer hand-wheel. Capacity is 3 in. in cast iron.



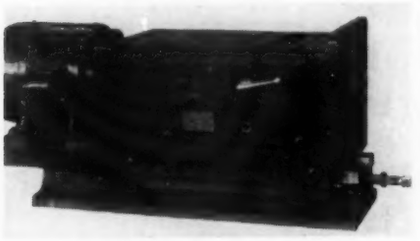
RADIAL DRILL BASE—*The Cincinnati Bickford Tool Co., Oakley, Cincinnati 9, Ohio.* The Super Service radial drill is mounted on a special-type base. The 24-fpm. power traverse and power clamping are controlled by a push-button located at the head of the machine. The 13-in. dia. column, 4-ft. arm radial drill has shortened column and large lifting bail.



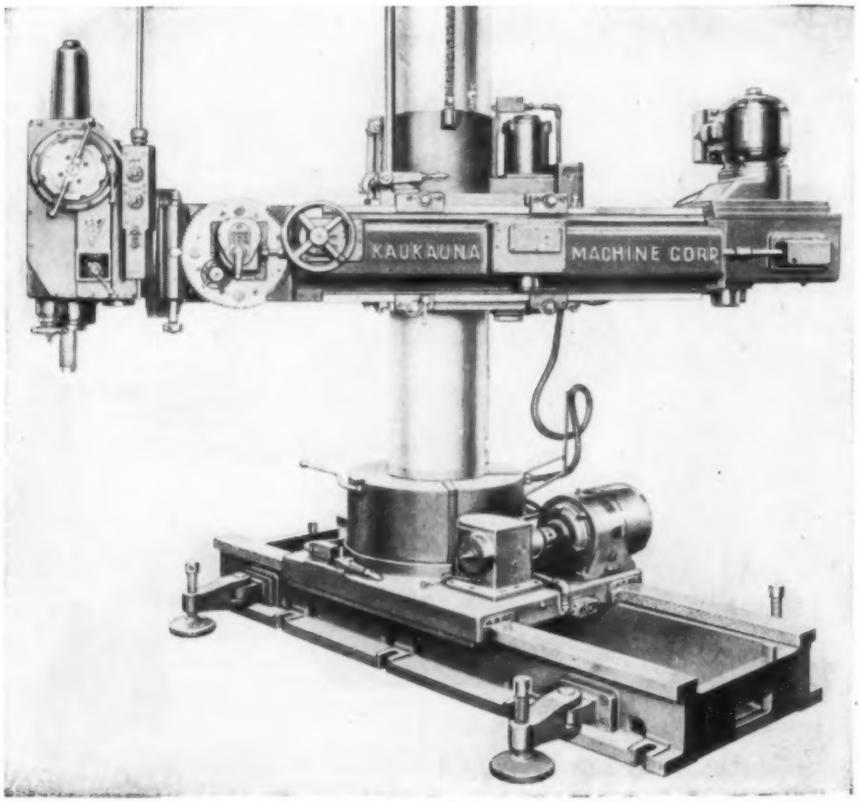
DRILL—*Cincinnati-Bickford Tool Co., Oakley, Cincinnati 9, Ohio.* Super Service precision drilling machine is primarily for use with the Bullard Man-Au-Trol Spacer. The head is mounted in a fixed position on the arm. The arm can be moved vertically on the column, but not rotated. A choice of spindle-speed ranges with 36 spindle speeds range from 14 to 893 rpm., to 26 to 1572 rpm. There are 18 power feeds.



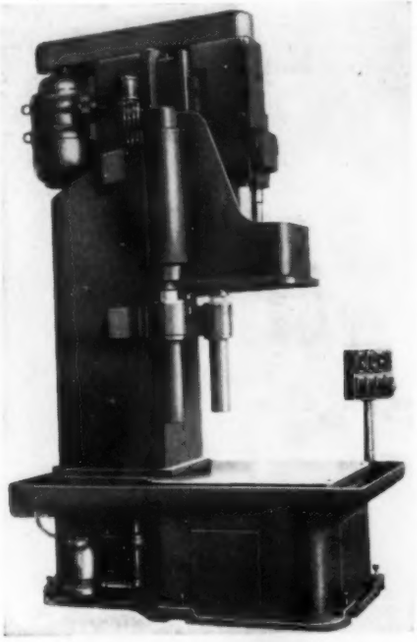
DRILLING MACHINE — *Taylor & Fenn Co., Hartford 1, Conn.* A two-spindle drilling and milling machine, M-202, is for small parts. The operator can load one side of the 180° index dial loader while the machine is operating on the part loaded on the opposite side.



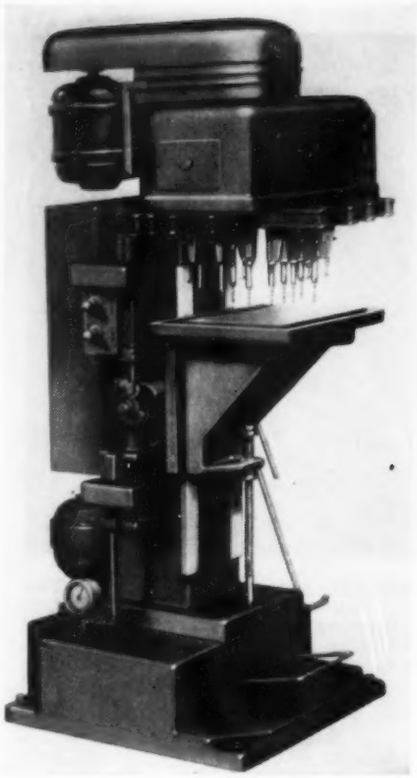
HYDRAULIC UNIT—*Baker Brothers, Inc., Toledo 10, Ohio.* Hydra-Unit No. 7½AA-14 is a self-contained hydraulic feed unit for single- and multiple-spindle operation. It can be mounted in the horizontal, vertical or angular planes and driven by 3-, 5- or 7½-hp. motors. Max. head travel is 14 in.



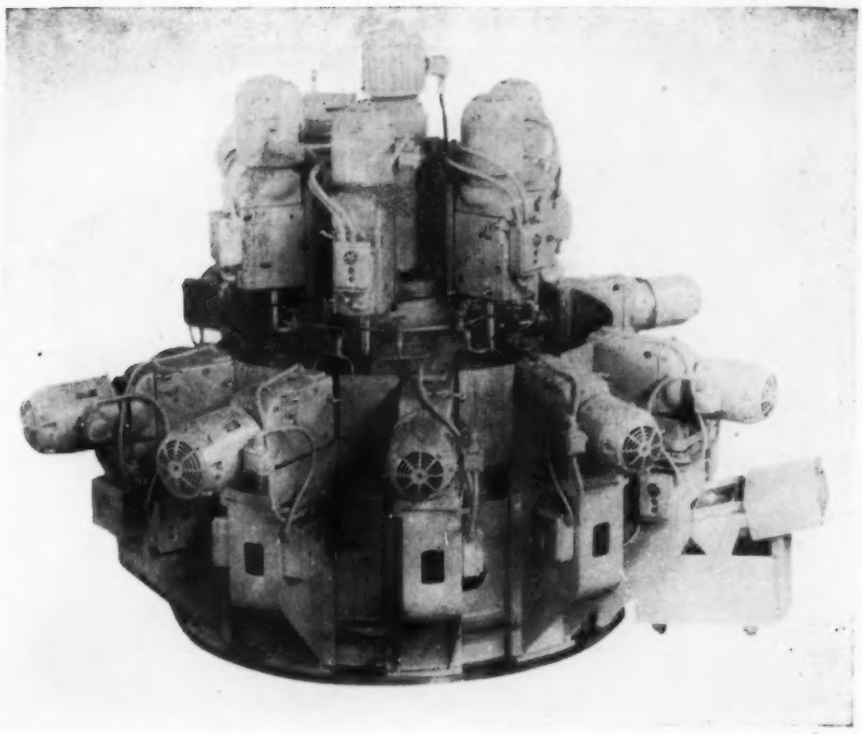
DRILLING, MILLING — *Kaukauna Machine Corp., Kaukauna, Wis.* Portable universal drilling and milling machines, Series 125, permit drilling and tapping at any angle in any plane within the limits of travel. Work can be mounted on a Model 700 indexing table.



AUTOMATIC DRILLER — *Robbins Engineering Co., 318 Midland Ave., Detroit 3, Mich.* An automatic drilling-machine, the No. 3 Drillmatic, is a standard machine tool for special-purpose adaptions. Interchangeable tooling heads are mounted on the saddle. Any number of spindles may be included in the head. The hydraulic-power unit is fully enclosed and self-contained. Auxiliary units can be mounted around base in horizontal, vertical or angular position.

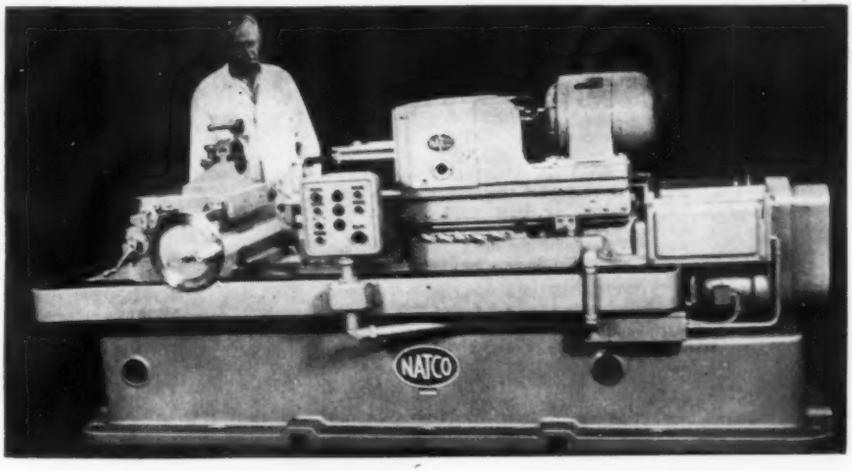


MULTIPLE DRILLING, TAPPING—*National Automatic Tool Co., Inc., Richmond, Ind.* Two, small multi-drilling and -tapping machines each have a head bored for ten spindles. Model A-33A provides hand and foot feed or combination hand, foot, and air-oil feed. It is for both drilling and tapping. Model A 33B is for light precision tapping with treadle-controlled air-feed table. All units can tap 8-32 and 10-32 in cast iron using ten spindles.

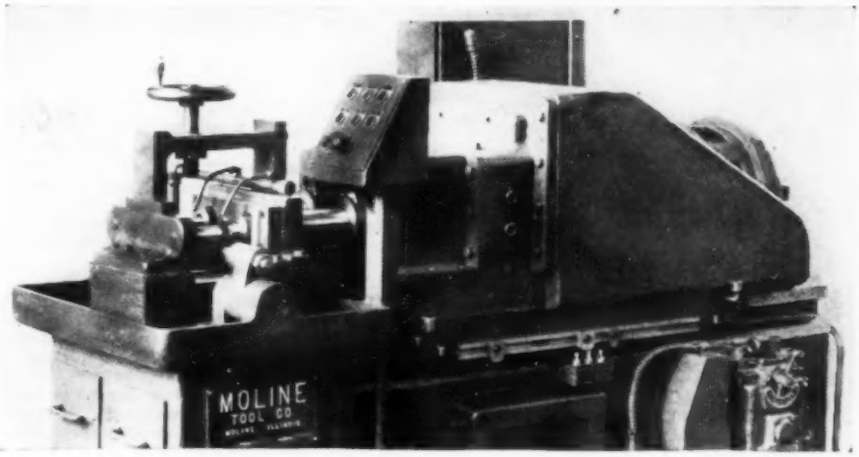


INDEXING MACHINE — *Kingsbury Machine Corp., Keene, N. H.* Twelve automatic units perform operations on three faces of the work in this automatic indexing machine. It has a 60-in. automatic index table with 12 chucks. Each time the table indexes, each chuck rotates 180°.

ELECTRONIC MECHANICAL FEED —*National Automatic Tool Co., Inc., Richmond, Ind.* Unit, Natco A-42 is used for drilling, reaming, boring, facing and tapping. Automatic work cycles are adjustable for many combinations of movements. Head is driven by 5-hp., 1200-rpm. electric motor. ↓

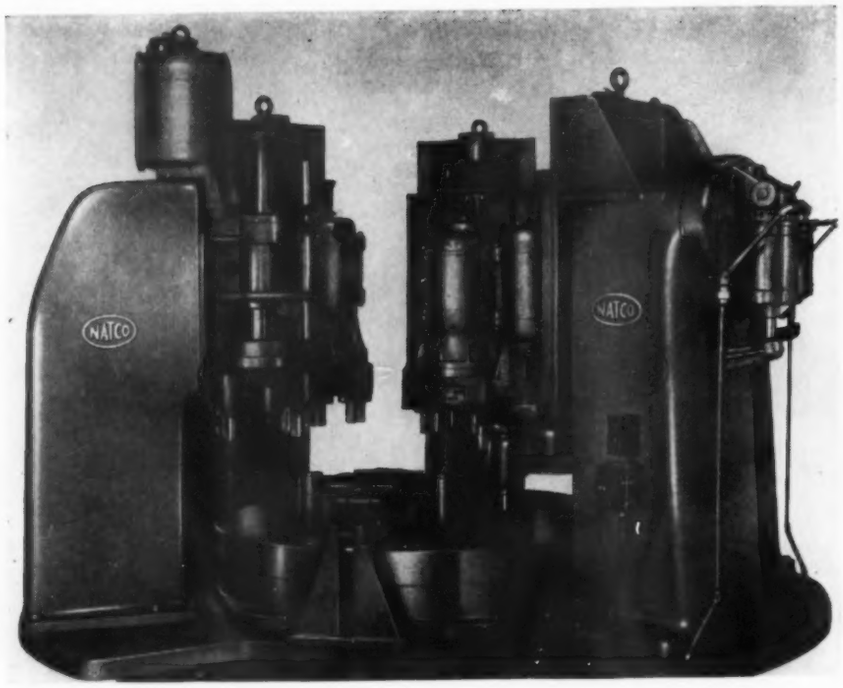


MECHANO DRILLPRESS—*The Electro-Mechano Co., 261 E. Erie St., Milwaukee 2, Wis.* The Speed-Right drillpress is used for production drilling of small holes with drill capacity from 0.004 to 5/32-in. dia. Different models are available with either ⅛- or 1/10-hp. motors. Speed range is 1000 to 10,000 rpm. or 2500 to 15,000 rpm.

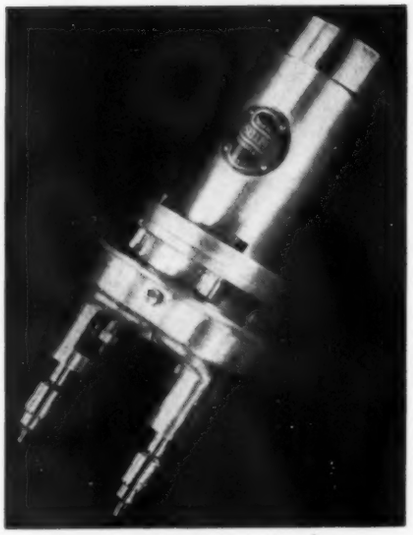


DRILL UNIT—*Greenlee Bros. & Co., Rockford, Ill.* A hydraulic way-type unit to handle special drilling and boring operations has ways with overall width of 7 in. A Vickers hydraulic pump and control panel are used. A single motor, ranging from 2 to 5 hp., drives the unit. Strokes can be from 18 to 30 in. Functions include rapid approach, variable feed, delayed dwell, rapid return.

HORIZONTAL DRILLER — *Moline Tool Co., Moline, Ill.* Ends of railroad-track sections are drilled for splice bars in this No. MR127, two-spindle, horizontal machine. A fixture, adjustable to various rail sizes, holds the rail while spindles advance hydraulically, feed drills through work, and withdraw. Cycle is automatic. ←

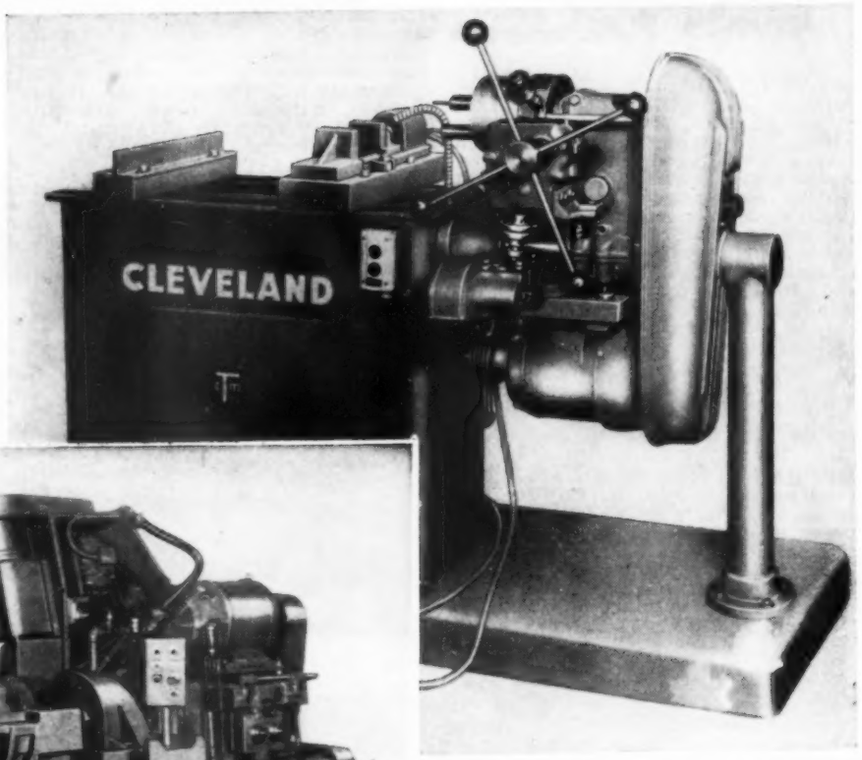


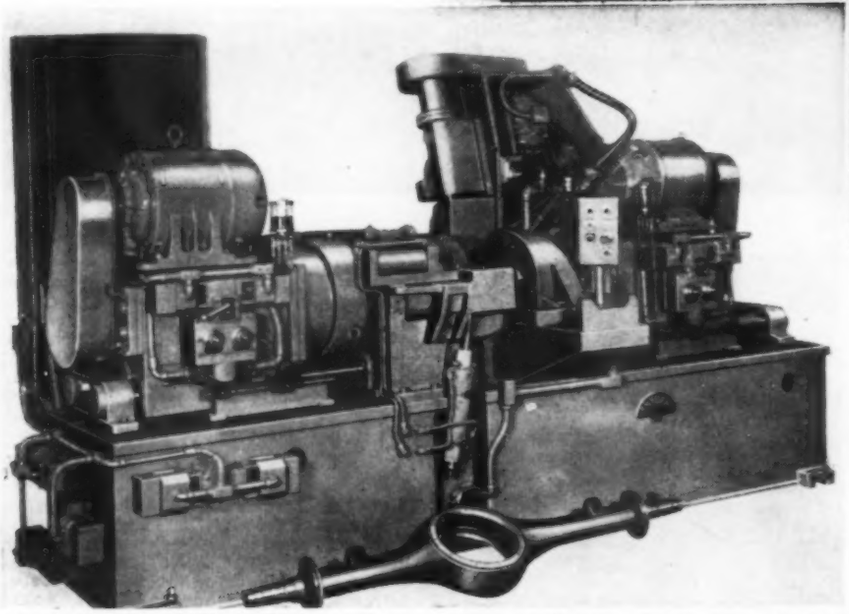
STATION-TYPE MACHINES — *National Automatic Tool Co., Inc., Dept. 20, Richmond, Ind.* Natco A-65 cam-feed units can be fabricated into special station-type machines for mass production of small parts. They can be arranged for automatic or semi-automatic operation. More than 400 master cylinder bodies per hr. are handled on the unit illustrated. Seven holes are drilled and four holes are tapped on each part.



DRILLHEAD—*Sellew Machine Tool Co., Pawtucket, R. I.* The "K" type adjustable drillhead is a two-spindle, totally enclosed, full ball-bearing unit. Drill capacity is 0 to ¼-in.

RADIAL ARM—*Empire Foundry & Machine Corp., Ashland, Ky.* The All-Angle radial arm mounts on standard 2-, 2¼-, 2½- or 2¾ in. column drillpresses. It increases chuck-to-base capacity by 5 in. Table or bed can also be mounted on radial arm.



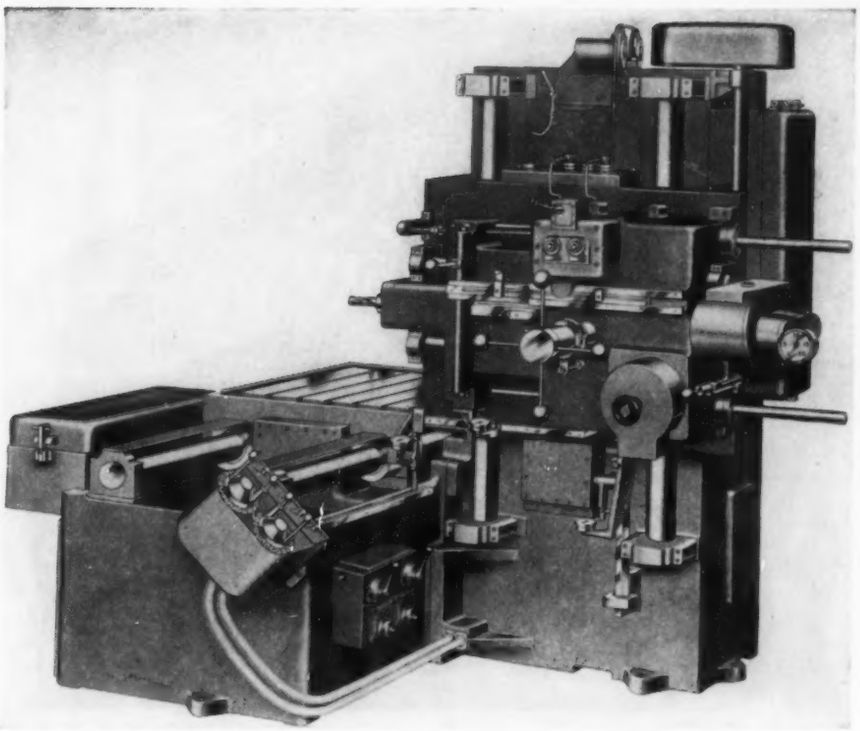


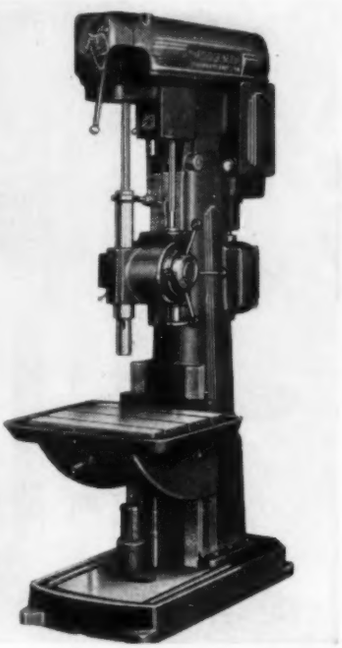
AUTOMATIC WAY DRILL—*Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit, Mich.* A special automatic machine for drilling truck rear-axle housings clamps, drills 21 holes and releases the work in a 15-sec. cycle. Drills operate at 60 sfpm. and feed 0.008 in. per rev.

DRILLING, TAPPING MACHINE—*The Cleveland Tapping Machine Co., Hartville, Ohio.* Horizontal machine is designed primarily to drill and tap large copper anodes to receive hanging hooks, but is suitable for long, irregular work. A hand control indexes the head for consecutive drilling and tapping.

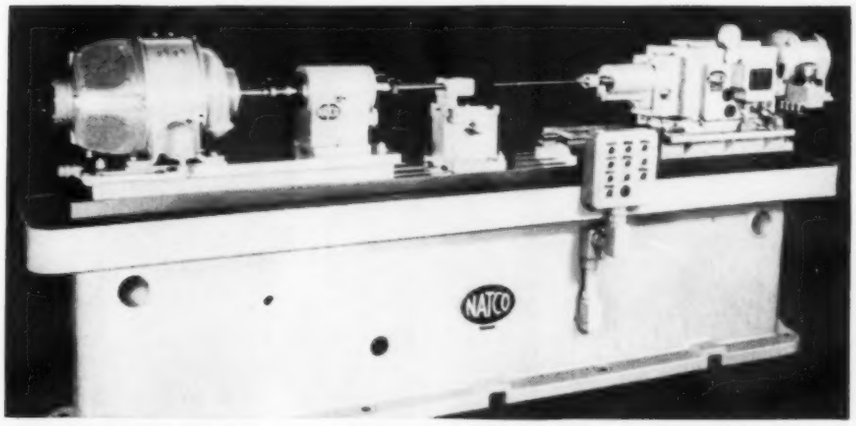
DRILLPRESSES—*National Pneumatic Co., Rahway, N. J.* Pneumatic operating equipment for installation on drillpresses supplied in the form of a kit (No. DC-40730), converts spindles to air-powered operation. The kit consists of operating assembly, foot-operated control valve, air strainer, cut-out cock, and flexible hose.

LOCATOR—*Bullard Co., Bridgeport, Conn.* No. 20 Man-Au-Trol Locator automatically locates work in relation to a rigid, horizontal spindle for drilling, boring, reaming, tapping and similar operations. The 7-ton machine tool incorporates a dial to set predetermined sequence of positions. A maximum of 400 positions are available. →

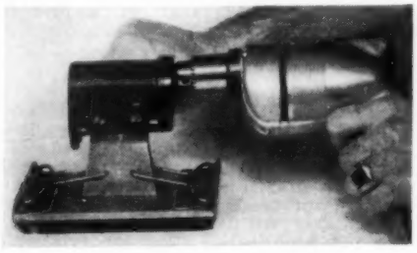




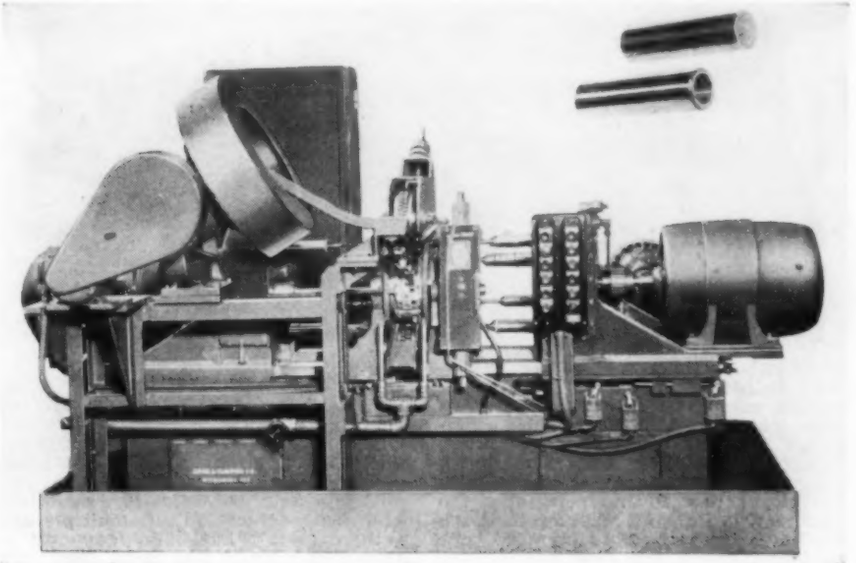
TAPPING AND DRILLING—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* 21-in. upright drill designed to provide a capacity between sensitive and heavy-duty upright drills. Gear box has nine or 18 speeds and four feeds, is integral with top bracket.



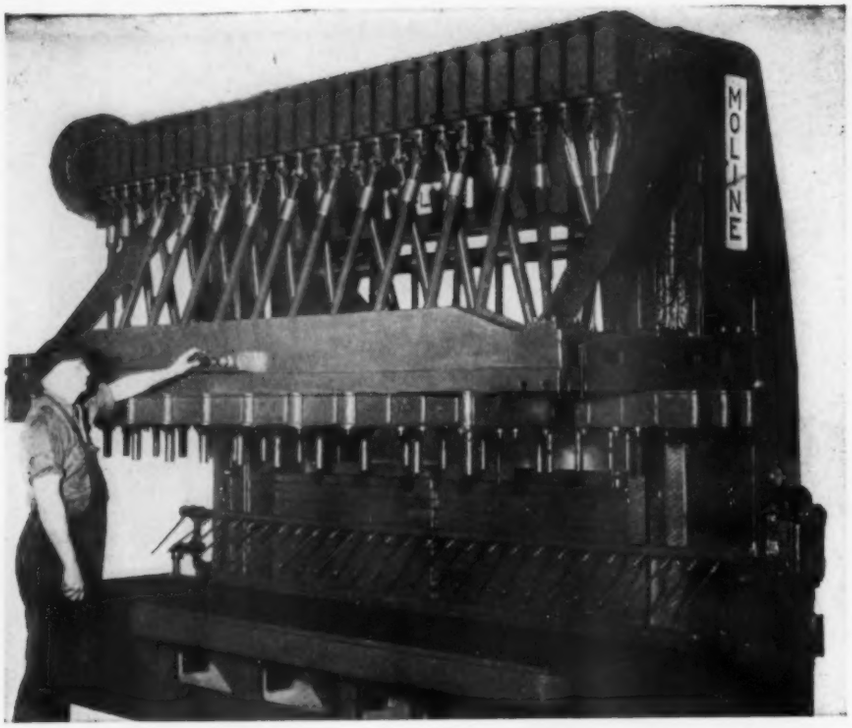
DEEP-HOLE DRILLER — *National Automatic Tool Co., Inc., Richmond, Ind.* Driller E9HU horizontal, right-hand head is equipped with quick-speed-change gear-driven drill spindle. It has hydraulic feed for either step-drilling or continuous-drilling cycles. Left-hand head is work-spindle head.



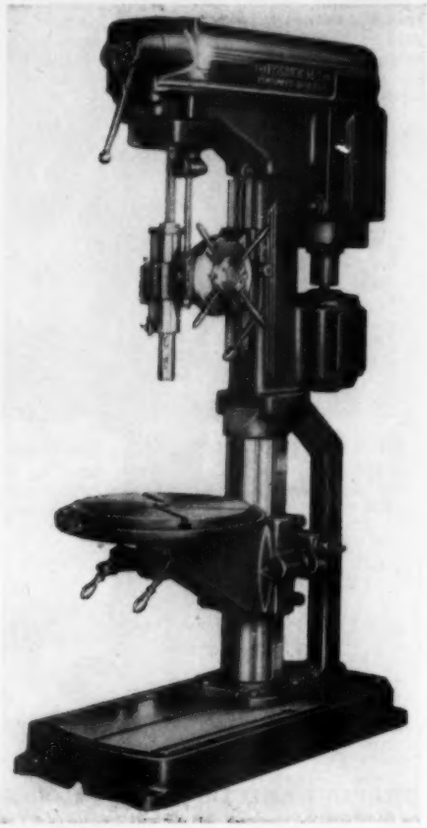
ATTACHMENT—*Lakeview Mfg. Co., P. O. Box 4080, Portland 8, Ore.* The Uni-Tool attachment for any type of electric drill, air drill or drillpress that will receive a 1-in. shank can be operated at any speed to 2500 rpm. All types of saw, chisel, knife and scraper blades, and files and other accessories can be fastened to the tool.



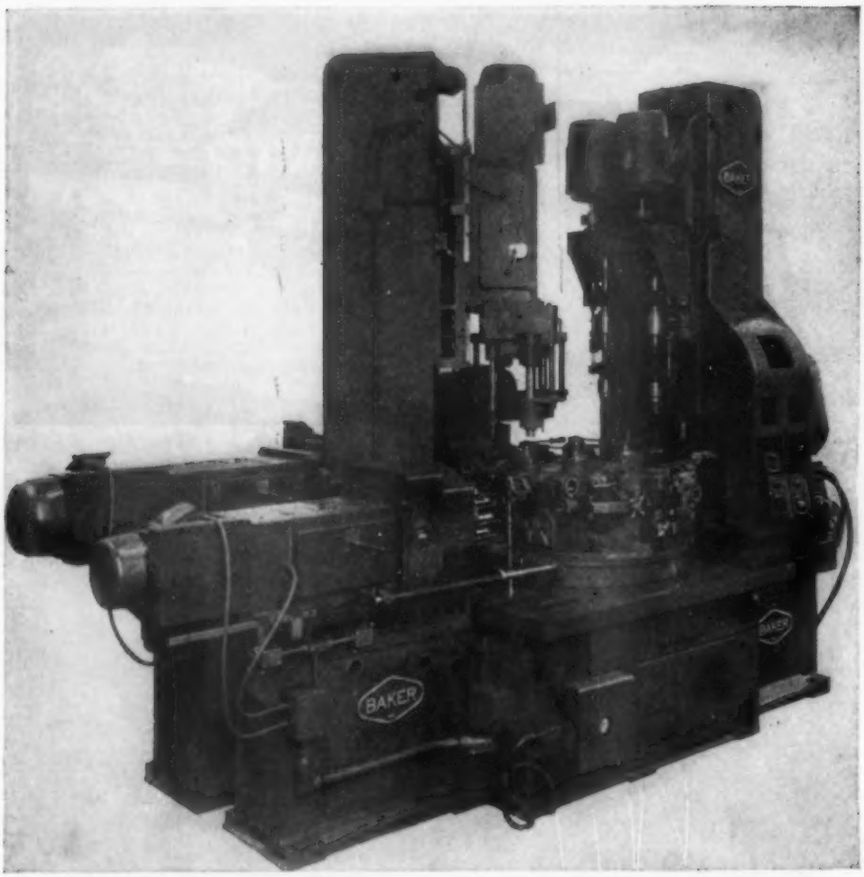
DRILLING, REAMING UNIT—*Davis & Thompson Co., 6411 W. Burnham St., Milwaukee 14, Wis.* H1-12 automatic horizontal drilling and reaming machine is primarily designed for operations on wrist pins, can be adapted to similar work. Two opposed drilling heads are mounted on a common bed, and power is supplied by two 7½-hp. motors. Production is 300 pieces per hr. Workpieces are automatically hopper fed and held by direct chain clamping. All functions are automatic. The hydraulic indexing fixture has six stations. →



UNIVERSAL-JOINT-TYPE DRILLER—*Moline Tool Co., Moline, Ill.* No. HU68 has a drilling area of 6x2 ft. Ten drillheads are driven through universal-joint spindle arms. ←



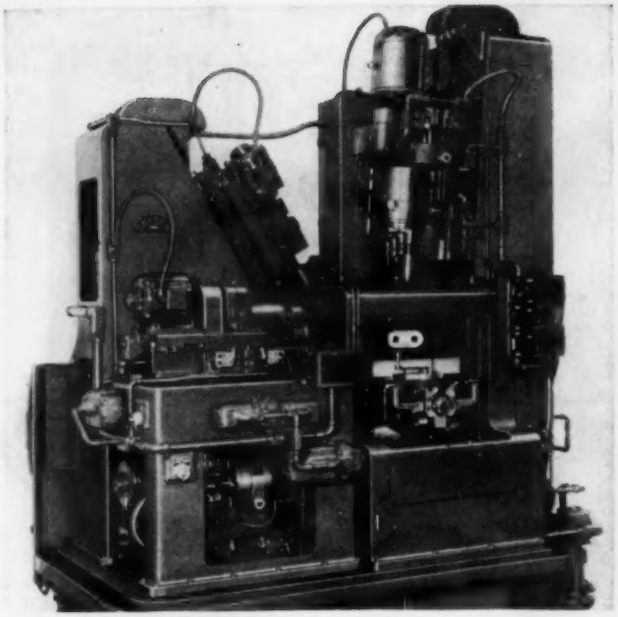
DRILL—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Heavy-duty sensitive drill with round table, No. 4 BMR, has six or nine spindle speeds obtained with a standard 1800-rpm. motor through a single lever. Table can be swung aside and large work placed on base.



SPECIAL MACHINE—*Baker Bros., Inc., Toledo 10, Ohio.* A multiple-operation machine for the production of cast iron gas-regulator bodies completes all drilling, boring, reaming, facing and testing operations. An automatic power-indexing table with 4 stations has 10 independently fed auxiliary units built around it. Each station is arranged to rechuck one part and chuck one new part.

UPRIGHT DRILL—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Simplified unit has only nine spindle speeds in geometrical progression, giving ranges from 37 to 600 rpm. to 100 to 1600 rpm. Four feeds are controlled by a single lever with direct-reading index. The machine is built in both box and round column type, and is available with multiple spindles up to six.

CAM-FEED UNITS—*Avey Drilling Machine Co., 118 W. 2nd, Cincinnati, Ohio.* No. 1 and No. 2 Cam Feed units for drilling, reaming, counterboring and tapping are self-contained with electric controls for operation and synchronization of multiple-unit setups. No. 1 has ½-in. capacity in cast iron. No. 2 has ⅞-in. capacity. →

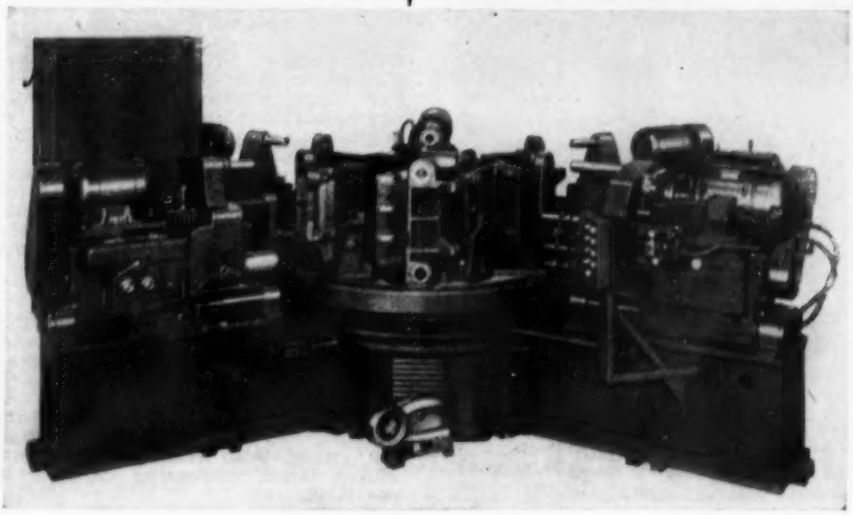


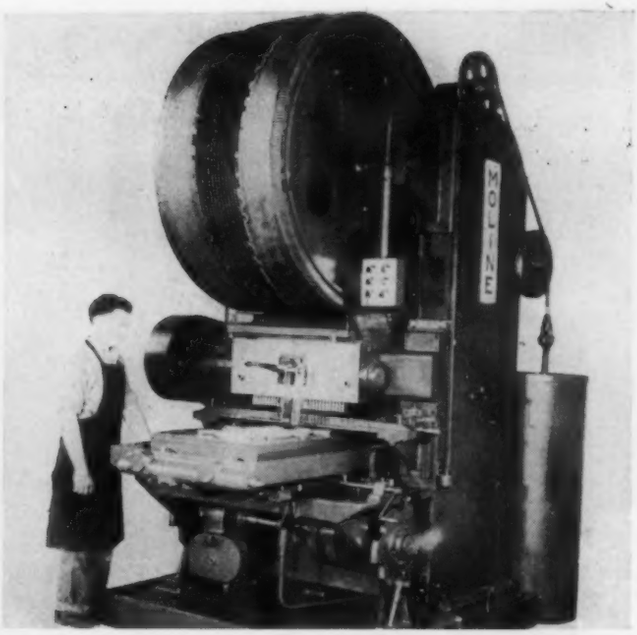
DRILLING, SPOTFACING — *Snyder Tool & Engineering Co., Detroit 7, Mich.* Operations of drilling, spotfacing, chamfering, and combination drilling and tapping on cast-iron intake manifolds are performed by automatic machine at production rate of 160 pieces per hr.

VERTICAL DRILL—*Baker Brothers, Inc., Toledo 10, Ohio.* Electronic-feed vertical drill has complete automatic cycling, is said to reproduce anything that can be done by means of an automatic hydraulic cycling system. Feed rate is variable over large range.

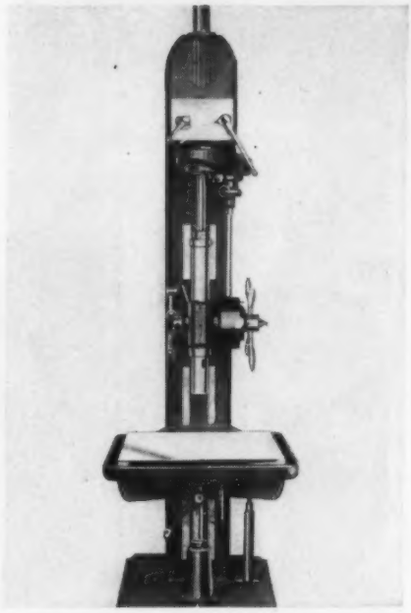
DRILLING MACHINE—*Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill.* New features in the line of drilling machines include 12 speeds and 9 feeds selected by dial control. There is improved feed-engagement control and a wider range of speeds and feeds.

SPECIAL MACHINE—*Snyder Tool & Engineering Co., Detroit 7, Mich.* Automatic unit performs 22 operations on cast-iron steering-gear housings. Combines drilling, boring, chamfering, spot-facing, reaming and tapping. Automatic Geneva indexing table has six stations. Five self-contained units complete one housing in 50 sec.

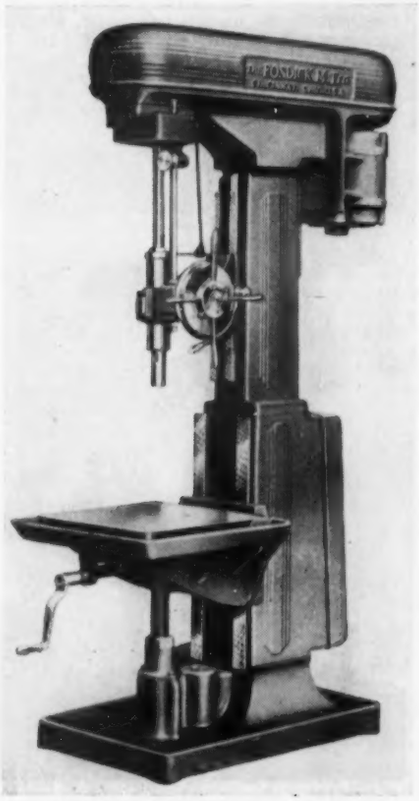




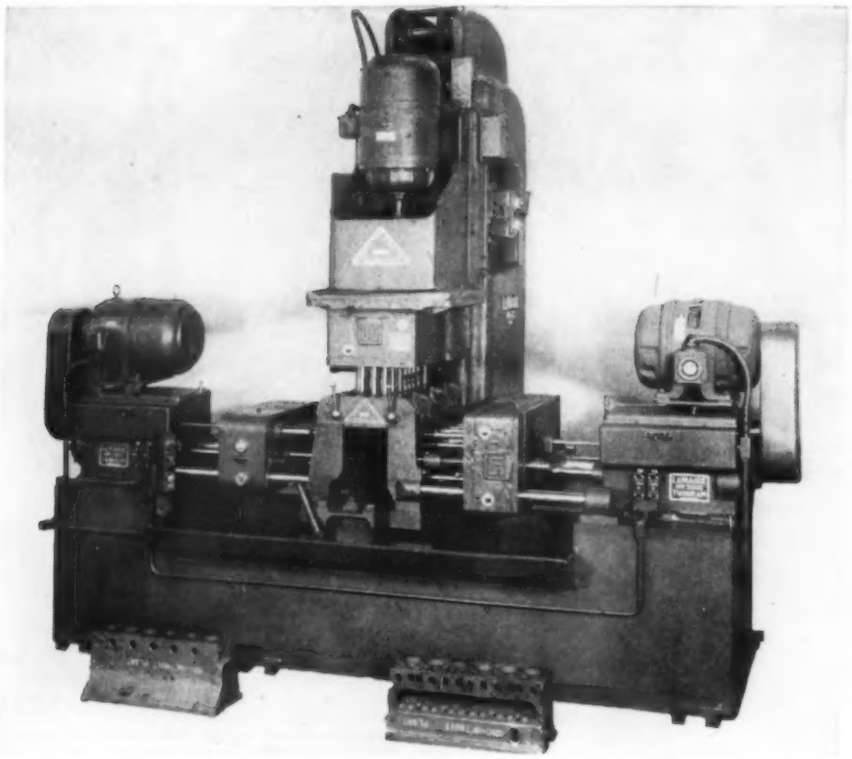
DRILLING—*Moline Tool Co., Moline, Ill.* 29-spindle machine for automatic drilling of aluminum header plates. Drum-type spindle selector, which is synchronized with indexing of worktable, permits setup for any hole pattern within range of machine. A maximum of 9657 holes can be drilled in one operating cycle. Table can index sideways to provide close spacing of holes.



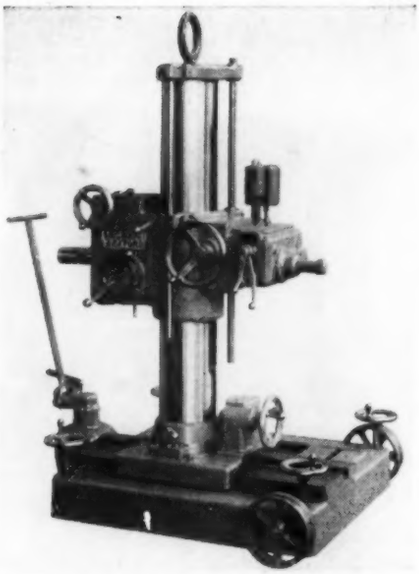
DRILL—*Buffalo Forge Co., Buffalo 5, N. Y.* Drill with 100 speeds, RPMster, has modifications which include an improved power-feed.



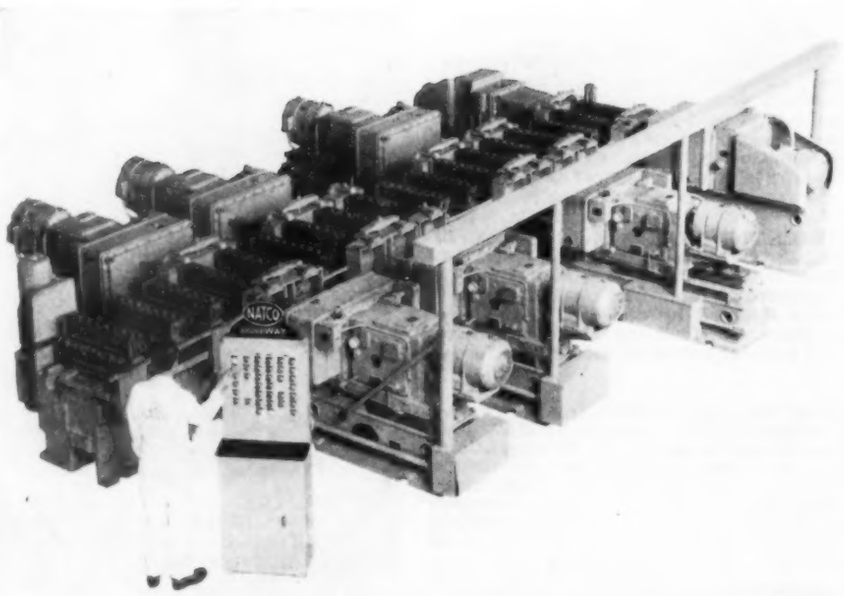
DRILL—*Fosdick Machine Tool Co., Cincinnati 23, Ohio.* Single-purpose sensitive drill has one speed and one feed selected to suit job to be done. Speeds from 100 to 3600 rpm. are obtained by changing V-belt sheaves. Built in single- and multiple-spindle types.

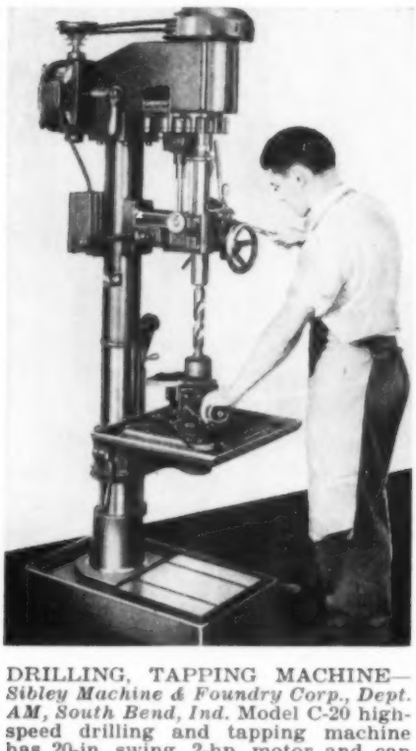


THREE-WAY DRILLER — *LeMaire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich.* Holes are drilled in the top and both sides of cylinder blocks in this three-way drilling machine. Production is approximately 60 pieces per hour, allowing 30 sec. to load and unload part.

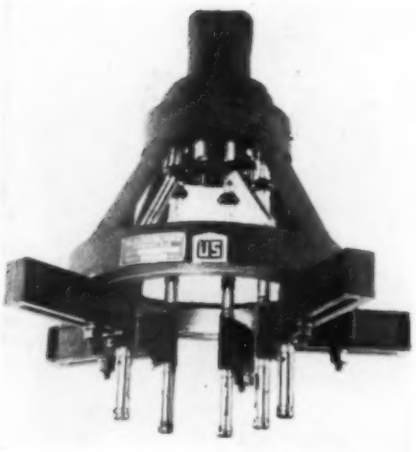


PORTABLE DRILL—*Cincinnati Bickford Tool Co., Oakley, Cincinnati 9, Ohio.* A portable horizontal drilling machine to assist in production of large and cumbersome parts has capacity for any drilling operation within the range of its 1½ hp. driving motor. Six mechanical speed changes from 100 to 950 rpm. can be obtained.



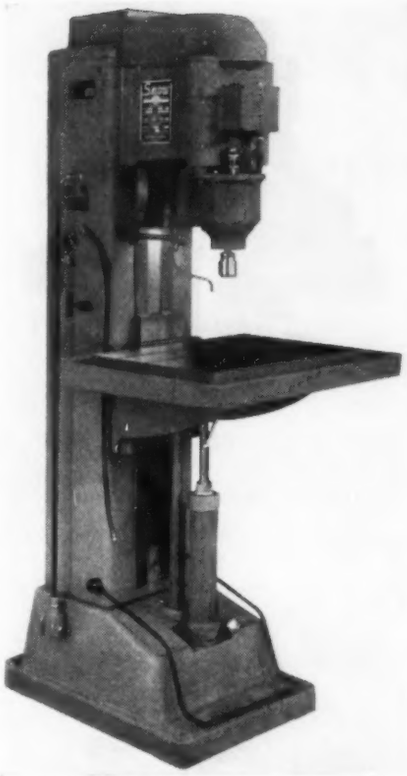


DRILLING, TAPPING MACHINE—*Sibley Machine & Foundry Corp., Dept. AM, South Bend, Ind.* Model C-20 high-speed drilling and tapping machine has 20-in. swing, 2-hp. motor and can drill 1½ in. in mild steel. There are four speeds from 65 to 225 rpm. in back gear, and four speeds from 400 to 1360 rpm. in direct drive.

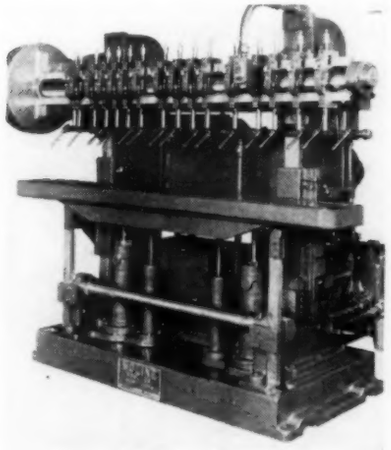


PROCESSING MACHINE—*National Automatic Tool Co., Inc., Richmond, Ind.* The Holeway, an automatic processing machine, can produce 90 engine blocks per hr. The machine, which involves 19 stations, drills 25 holes and countersinks or taps many of them. One operator is needed for the controls, while the machine automatically advances the work from one station to the next and ejects it onto a roller conveyor at completion.

DRILLHEAD—*U. S. Drill Head Co., 616 Burns St., Cincinnati 4, Ohio.* Adjustable multiple-spindle universal-joint drillhead with two to ten spindles, with No. 1 Morse taper. Each can drill ½-in. dia. hole in cast iron. Spindles can be adjusted within 10-in. dia. circle. Also available with No. 2 Morse taper, increasing capacity to ← ¾ in.

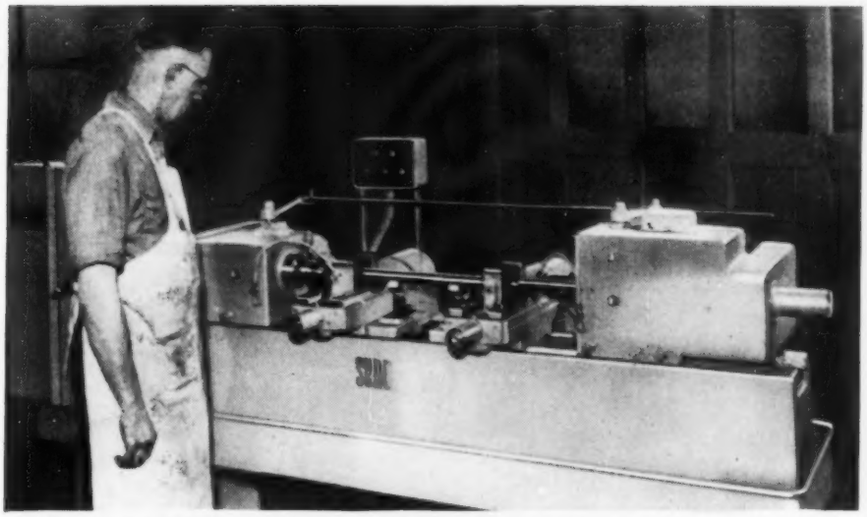


AIR MACHINE—*Snow Mfg. Co., 615 S. California Ave., Chicago 12, Ill.* The Snow air tool is a basic machine around which are built a drillpress, a threading machine or a universal tapping machine. The drillpress has infinite feed, split-second control and automatic withdrawal of drill. It is available in two sizes. The threading machine operates at high threading speeds and comes in sizes No. 3 and No. 4. The universal tapping machine comes in four sizes.

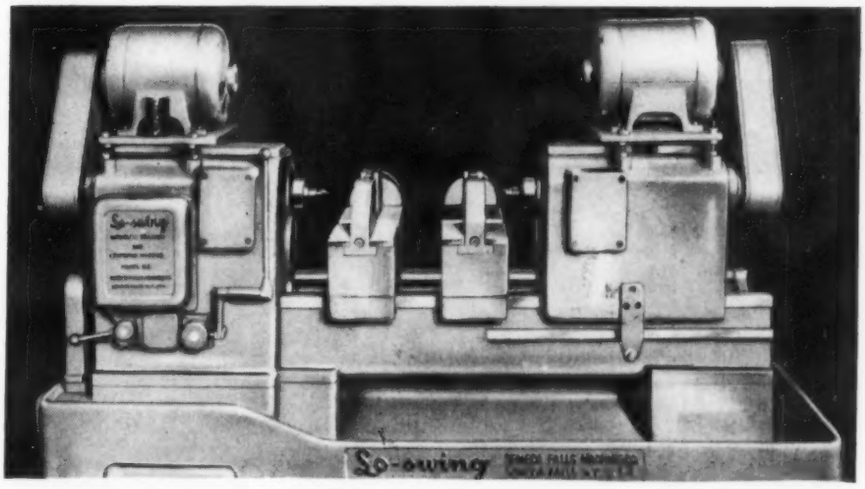


STRAIGHT-LINE DRILLER—*Moline Tool Co., Moline, Ill.* No. HF9 has spiral drive to 22 drillheads which may be adjusted for spacing along the length of the driving spiral. The automatic operating cycle has electric push-button control, hydraulic feed to table, and automatic jump feed for operations such as pipe drilling.

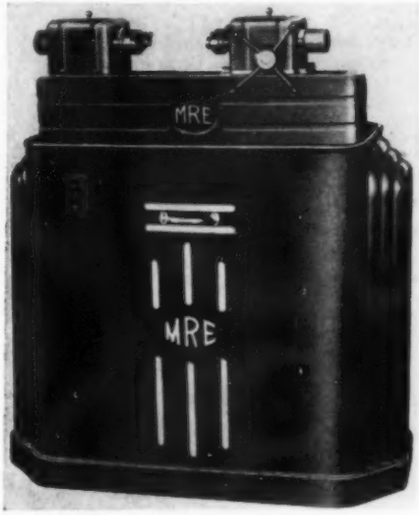
POWER FEED — *Canedy-Otto Mfg. Co., Chicago Heights, Ill.* Hydraulic power feed for its sliding-head model drillpresses makes machine fully automatic. It can provide reciprocating action to spindle.



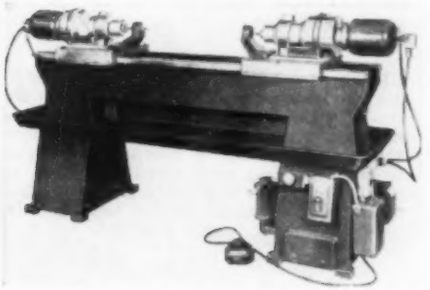
CENTERING MACHINE—*Sundstrand Machine Tool Co., Rockford, Ill.* A double-end drilling and centering machine, No. 53A, provides both power feed and power clamping. It has individual motor drive to each head. Self-centering vise jaws hold work from ½ to 4 in. Max. length of work is 24 in., but machines can be furnished in 48- and 72-in. lengths.



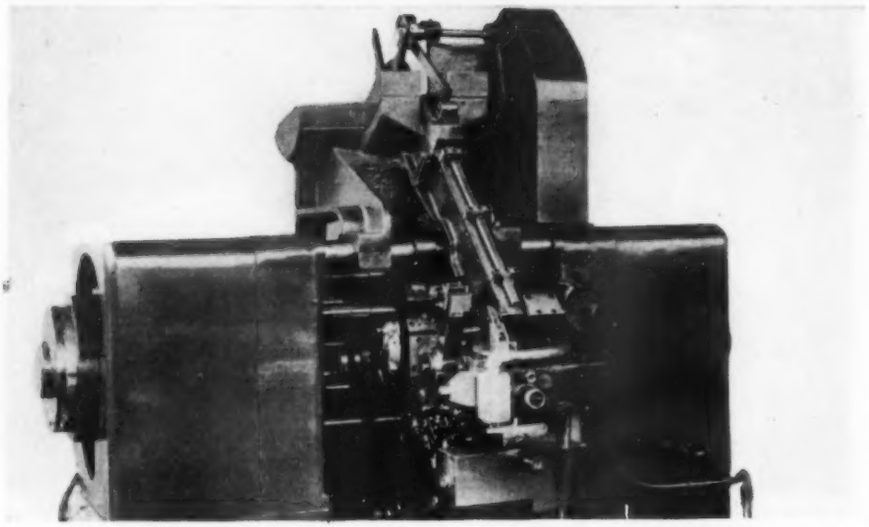
CENTERING MACHINE — *Seneca Falls Machine Co., Seneca Falls, N. Y.* Model CS Lo-Swing automatic drilling and centering machine replaces Model CM. Heads are individually motor driven with standard motors, permitting a wide range of spindle speeds through pickoff gears. The machine cycle is automatic.



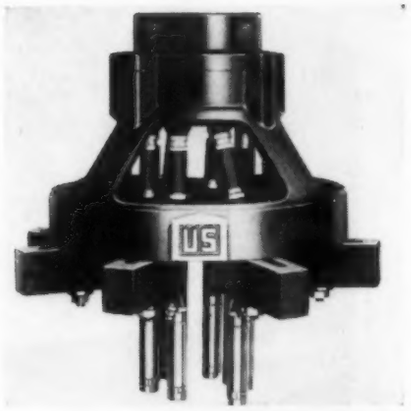
CENTERING MACHINES—*Manchester Repetition Engineers, Ltd., distributed by Accreylon Co., 130 W. 42nd St., New York 16, N. Y.* Single- and double-head centering machines have capacity of 3/16 to 1¼-in. dia., with 12-in. max. length. Extended head can increase length to 21 in. Accuracy is said to be within 0.001 in. of concentricity.



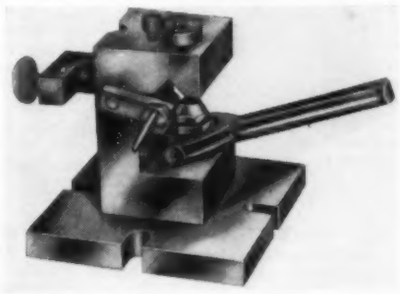
CENTERING MACHINE—*Klatt & Wood Co., 329 20th St., Toledo, Ohio.* Robotrill drilling heads, designed to provide robot-like control of drilling operations are used on the Robotrill Automatic Cycle centering machine. The heads operate in any position, and are self-contained units. Micrometer adjustment of the spindle and depth control to within 0.002 in. are provided.



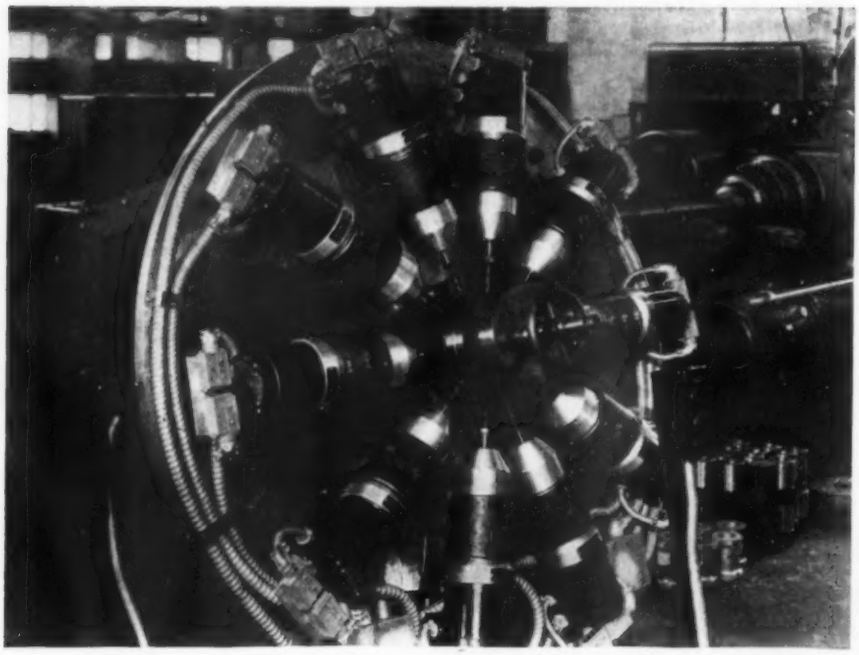
DRILLER—*Buhr Machine Tool Co., Dept. K., 800 Green St., Ann Arbor, Mich.* An automatic double-end driller, the Buhrmatic is for production drilling of crossed holes. The hopper-fed machine drills, reams, countersinks and checks at desired angles by indexing the collets in an indexing turret. It provides eight work stations and a loading and unloading station.



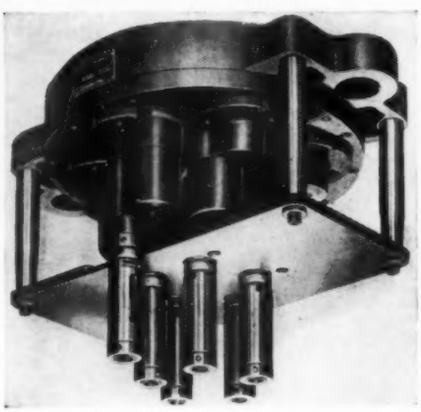
MULTIPLE DRILLHEAD — *U. S. Drill Head Co., 1960 Riverside Dr., Cincinnati 4, Ohio.* Multiple drillhead has eight spindles which can be adjusted to minimum distance between spindles of 11/16 in. anywhere in 6-in. dia. circle.



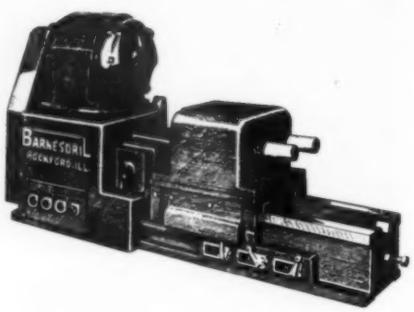
DRILL JIG—*Matco Tool Co., Div. Machinists Tool Co., 2830-36 W. Lake St., Chicago 12, Ill.* Universal drill jig is mounted on a 4x4½-in. removable base and stands 3⅞-in. high. By using the thumbscrew as a positive stop and the adjustable ground anvil for a locating base, holes up to 5/16-in. dia. can be drilled and duplicated in stock up to ¾-in. O.D. Material up to 1-in. dia. can be accommodated on the opposite V-groove.



SPECIAL MACHINE—*Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Automatic brake-band drilling unit handles automatic transmission. Loading is manual. Operator presses button and fixture moves by air pressure through two positions and returns to original position. Ten holes are drilled at each position by drill units.



DRILLHEADS—*Strutz & Mead, Inc., Milwaukee 2, Wis.* Line of medium-heavy-duty multiple drillheads, are available in standard models having from 2 to 6 spindles. These Kwick-Change drillheads will drill holes up to 23/32 in. in cast iron.



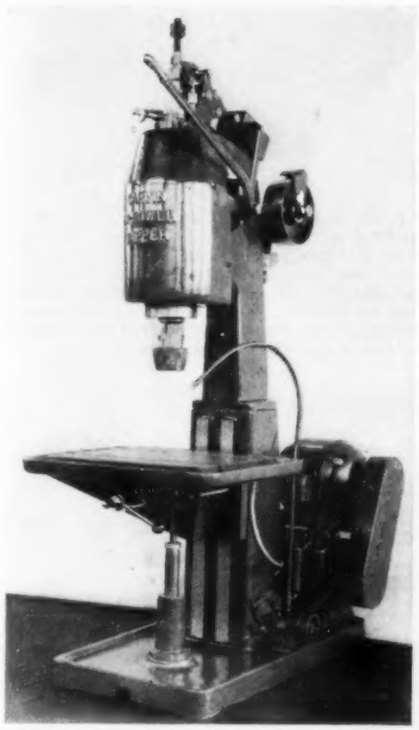
SPEED CHANGER—*Chicago Drillet Corp., 1729 N. Winchester Ave., Chicago 22, Ill.* A speed changer for drillpresses uses one variable-speed pulley and one four-step cone pulley. A standard drillpress equipped with changer will have a range from 435 to 4550 rpm. A single lever is used to change speeds.

HYDRAULIC UNIT—*Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill.* Small hydraulic unit of 2-hp. capacity is equipped with air traverse for rapid approach, hydraulic feed and air traverse for rapid return. Intended for high-production machines.

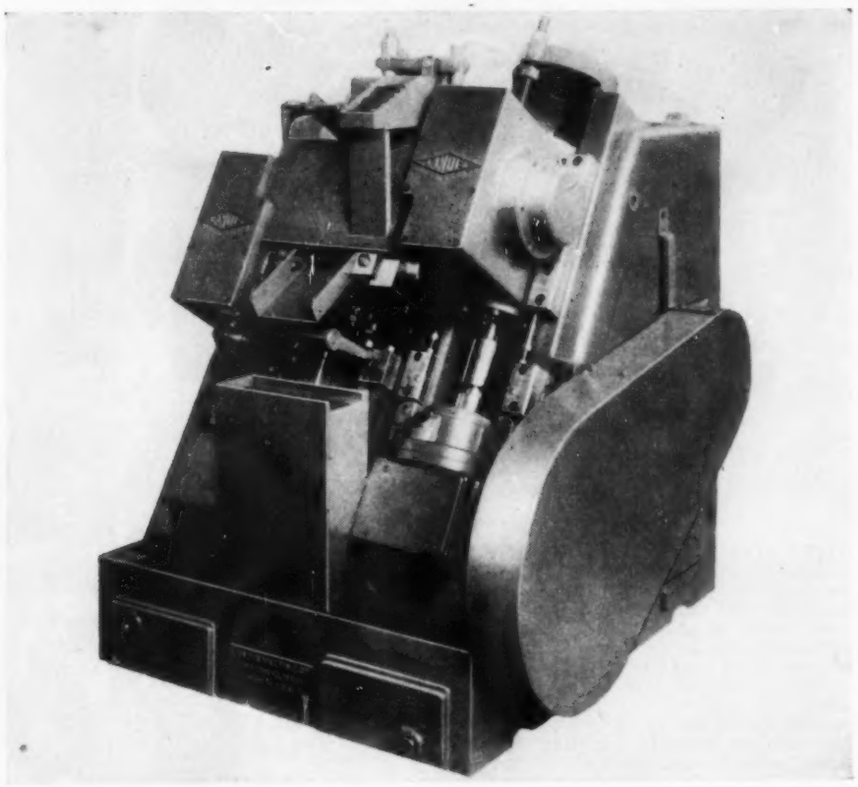
DRILL SPEEDER—*The Dumore Co., Racine, Wis.* Speeder fits into chuck of any standard drillpress, lathe, milling machine or special unit. A self-contained electric drill, it supplies own power (1/16 hp.). Speed is 1700 rpm. for drills from No. 80 to ⅛-in. dia.

Tapping and Threading

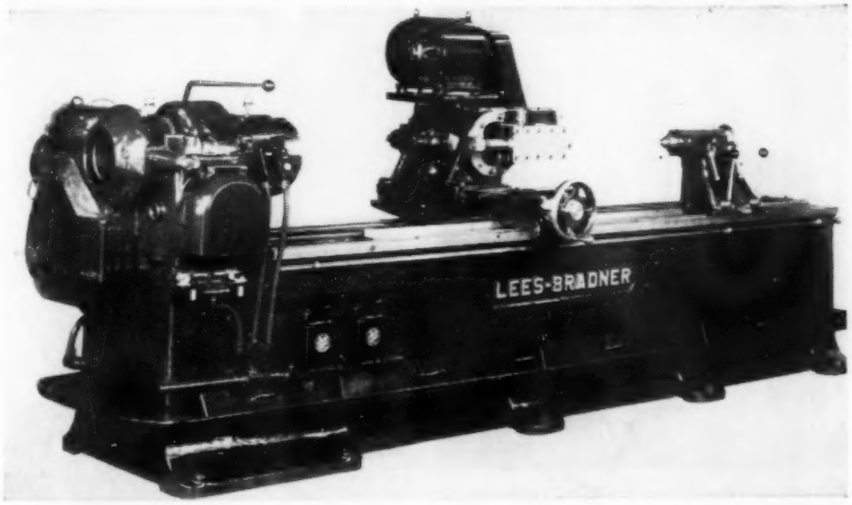
AMERICAN MACHINIST 35th ANNUAL REVIEW



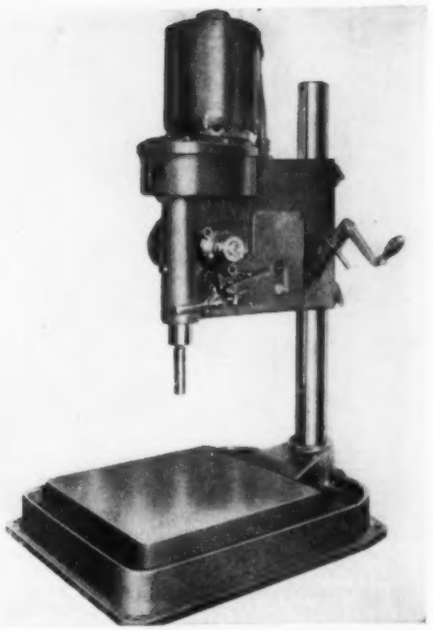
TAPPING MACHINE—*Western Machine Tool Works, Holland, Mich.* The Garvin Hi-Power tapper has capacity for a 3-in. tap in cast iron. It retains the automatic-operation feature of the other Garvin tappers. The operating lever is pulled down, the tap enters pre-drilled hole, taps to required depth, reverses and backs out to original setting at higher speed.



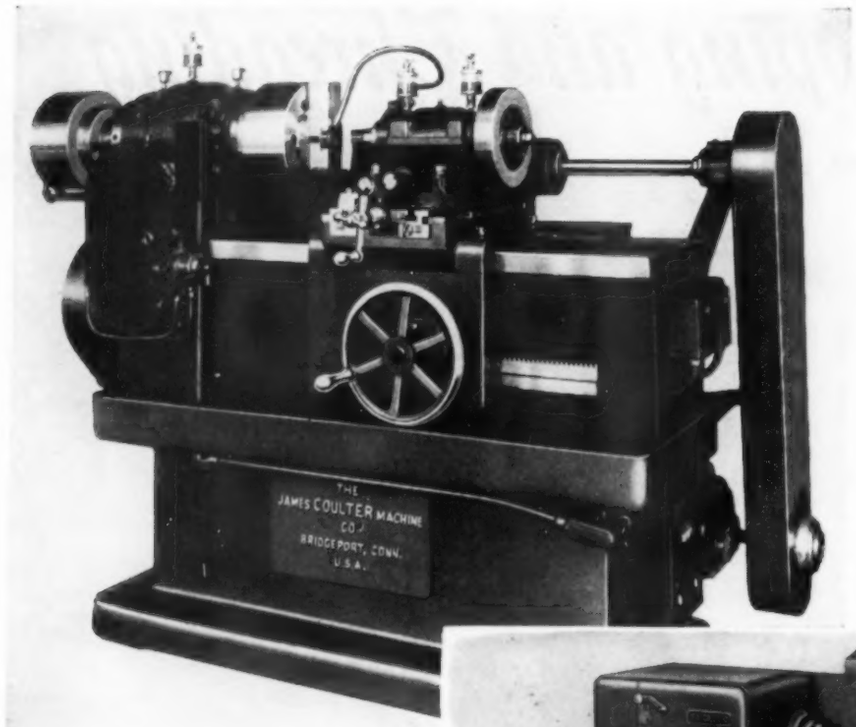
THREAD-ROLLING—*Landis Machine Co., Waynesboro, Pa.* A thread-rolling machine for rolling screw threads, knurling, marking and similar operations on cylindrical parts permits rolling threads on one, two or more diameters of work in a single pass.



THREAD-MILLING MACHINE — *Lees-Bradner Co., Cleveland 11, Ohio.* Model HT is semi-automatic. Cutter is automatically brought to required depth against positive micrometer stop, fed across the face of part being threaded, and automatically withdrawn at completion of cut. Model handles ring and hob-type work; also single cutter, disk-type thread hobs.

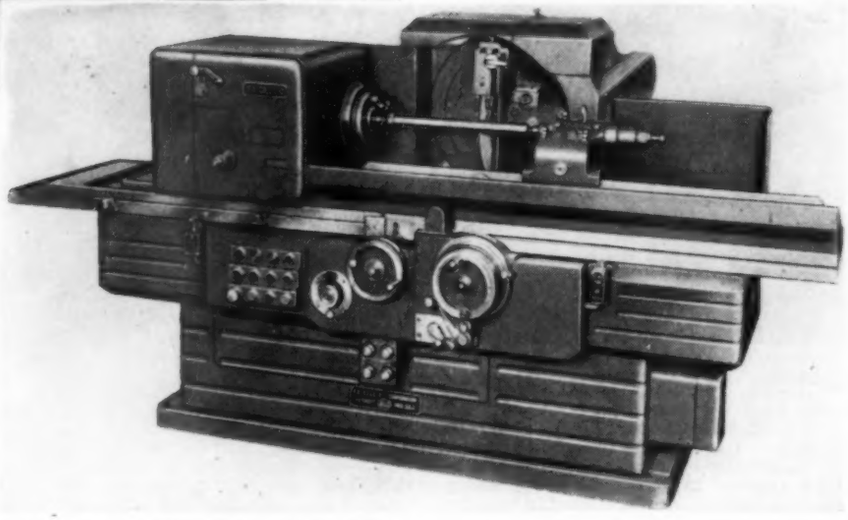


BENCH TAPPER—*Buhr Machine Tool Co., Dept. K, 800 Green St., Ann Arbor, Mich.* A production bench tapping machine has selective full-automatic cycle or hand operation with safety clutch. Max. vertical travel is 27/16 in.

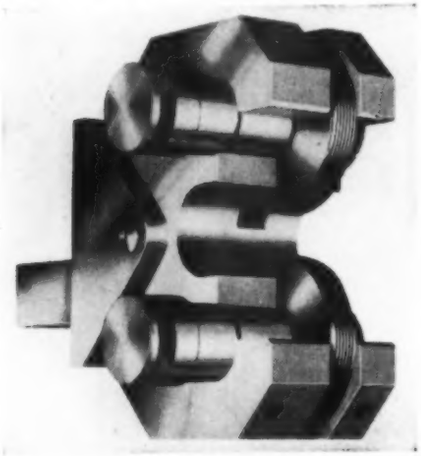


THREAD-MILLING MACHINE — *James Coulter Machine Co., Dept. R, Bridgeport 5, Conn.* Separate motors on work and cutter spindles provide a wide range of speeds and feeds. Type HT and HS hob thread-milling machines have been adapted for operation in straight and taper threading dies. Pipe dies from ⅜- to 2-in. size can be thread milled in unit illustrated. Machine for straight dies has capacity from ¾ to 2-in. standard die size.

HAND TAPPER—*The Producto Machine Co., Bridgeport 1, Conn.* Precision Midget, in three sizes, can be used on bench. Adjustments permit tap spindle to reach any point within size of table. Removable spindle accommodates bushings for all tap sizes within capacity of machine.



THREAD GRINDER — *Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Precision thread grinder, Style 35-A, is hydraulically operated and electrically controlled. It accommodates single- or multi-ribbed wheels with diamond dressers or form crusher.

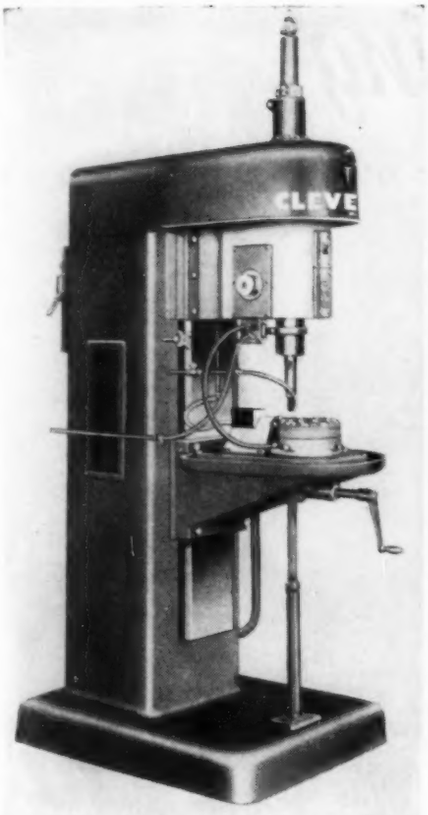


LANROLL ATTACHMENT—*Landis Machine Co., Waynesboro, Pa.* The Lanroll attachment for rolling straight threads is for almost any make of automatic screw machine or turret lathe. It processes threads which otherwise would have to be handled in secondary operations as the result of shoulder interference or positions inaccessible for a diehead.

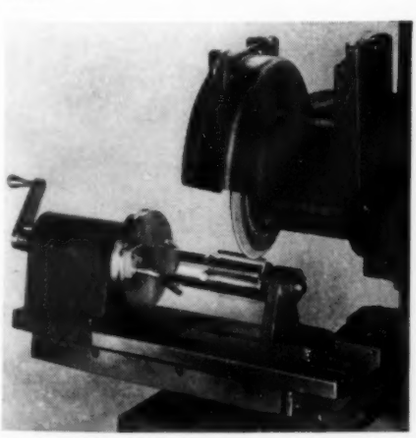
TAPPING MACHINES — *Procunier Safety Chuck Co., Dept. AM, 18 S. Clinton St., Chicago 6, Ill.* Universal tapping machine series incorporate the Hi-Boy motor-driven gear pump which supplies a continuous flow of lubricant to tap.

TAPPER — *Dorman Machine Tool Works, Mount Vernon, N. Y.* A tapper, for both external and internal threading to ⅜ in. in steel or any material, will take (left to right) machine or hand taps, round-split or button dies, or acorn dies.

NUT TAPPER—*National Machinery Co., Tiffin, Ohio.* Unit receives blanks from nut-forming machine and automatically taps ⅜-in. nuts to class 3 fit.

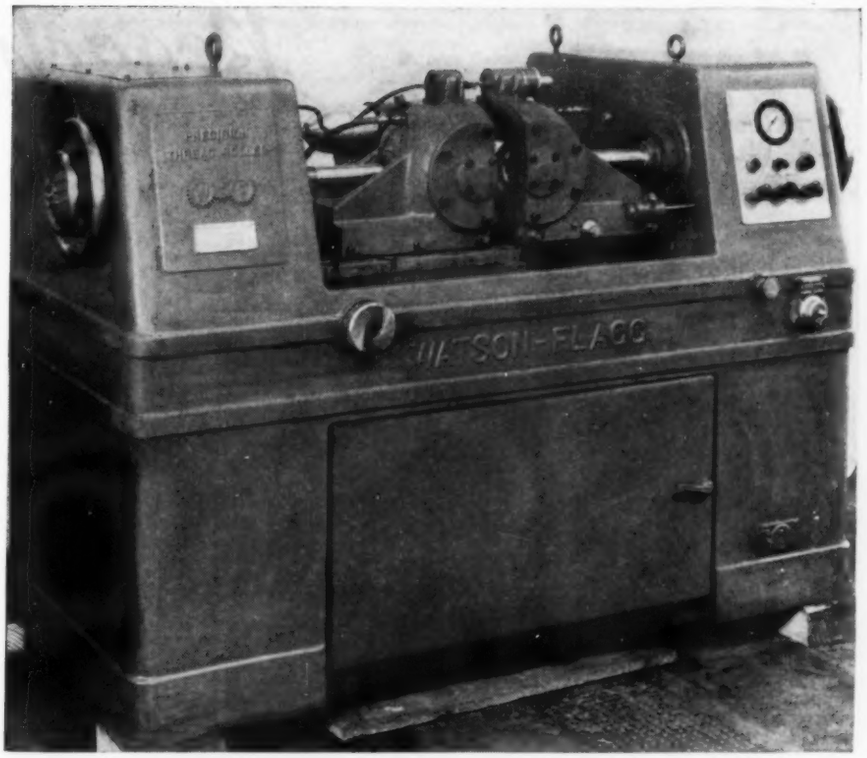


TAPPING MACHINE—*The Cleveland Tapping Machine Co., Hartville, Ohio.* Model E leadscrew tapping machine permits use of multiple heads for tapping groups of holes, even of different pitch, with each stroke of spindle. Indexing tables, cross-slides and hopper feeds can be combined with automatic cycling to provide full-automatic operation. Machine is made in six sizes, covering a tapping range in mild steel from ¼- to 2¾-in. N.C.

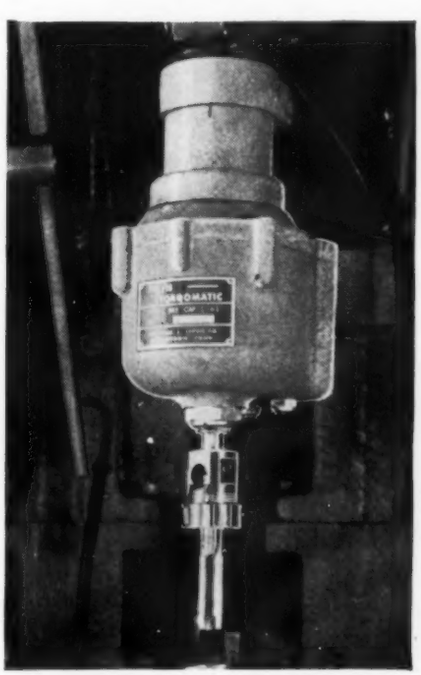


THREAD GRINDER — *Tinker's Thread Grinder Co., 169 Granby Rd., South Hadley Falls, Mass.* Unit for grinding threads of any shape can be held on magnetic chuck of any standard-make surface grinder. Max. dia. that can be ground is 4 7/16 in. Max. length between centers is 8 in.

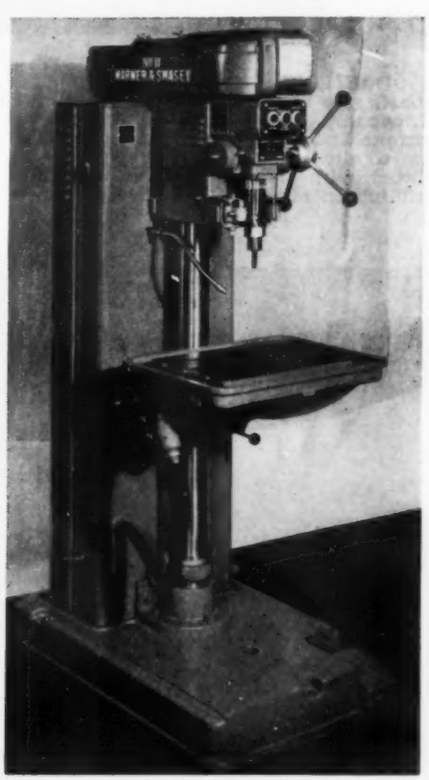
TAPPING—*Govro-Nelson Co., 1931 Antoinette St., Detroit 8, Mich.* Model KT tapping unit eliminates clutch, gears and lead-screw. Centrifugal pressure provides feed which automatically handles any number of threads per inch. Feed permits unit to tap 0-80 and ¼-20 without adjustment.



THREAD ROLLER—*Watson-Flagg Machine Co., Paterson, N. J.* Model C precision thread roller is designed to give class-4 threads as long as blanks are held to size. Hydraulic rolling pressure continues until the piece reaches size. With manual loading the rate is 600 pieces per hour when rolling larger sizes to 2-in. dia. Work from 0.138 to 2½ in., with a thread length to 2¼ in., can be handled.



TAPPING ATTACHMENT — *The Charles L. Jarvis Co., Department 10, Middletown, Conn.* The Torquomatic torque-driven tapping attachment is available in three sizes. In standard or built-in models, it can be made to fit any drillpress or tapping machine.



THREADING, TAPPING—*Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* A completely redesigned line of precision threading and tapping machines. The smallest is a No. 10 which runs at a rate of approximately one hole a second with automatic indexing fixture. The largest is a dual radial mounting of these tappers on a large base. A feature of the latter is the complete enclosure of all the accessories in a cabinet mounted on the machine base.

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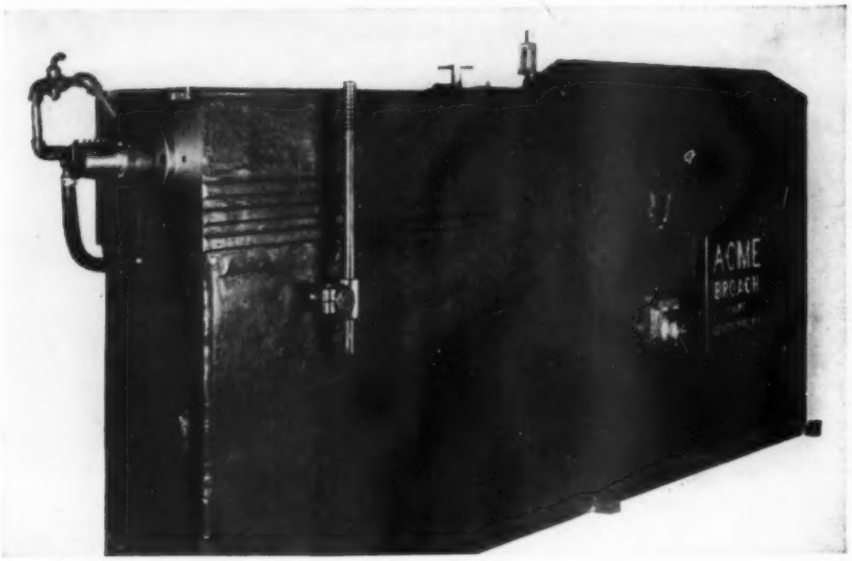
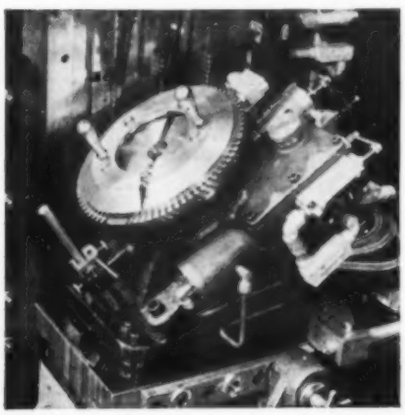
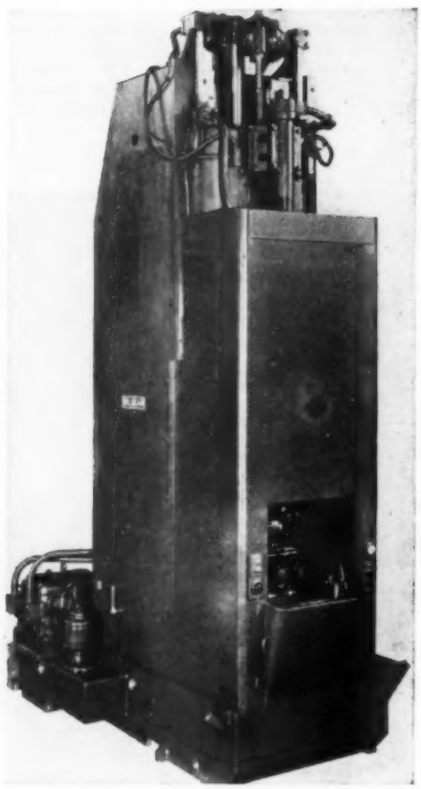
Broaching



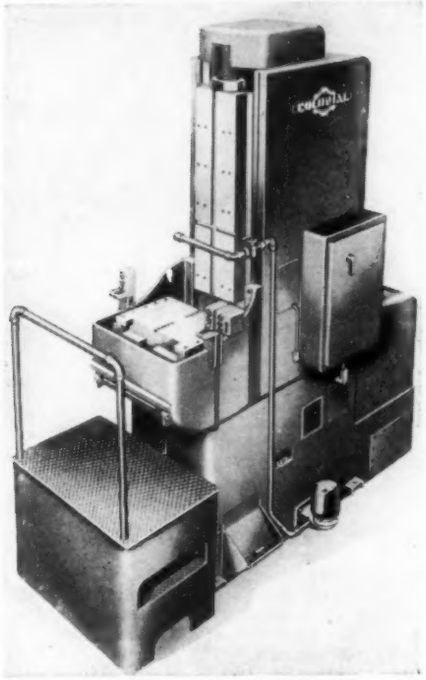
BROACHING — *Acme Broach Corp., Lexington 21, Ky.* H-4T-36S horizontal broaching machine, in 4-ton 36-in. stroke and 2-ton 36-in. stroke capacity, is totally enclosed. Puller slide is fitted with adjustable take-up liners sliding on hardened and ground ways.



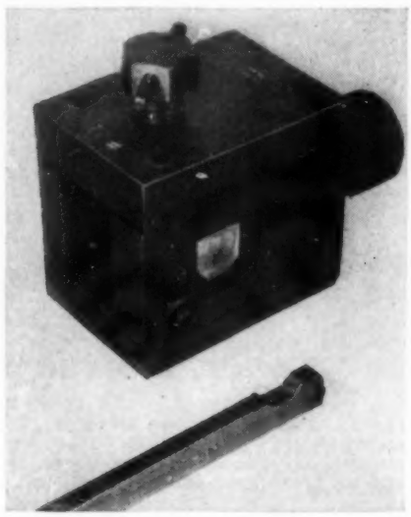
BROACHING MACHINES—*The Lapointe Machine Tool Co., Hudson, Mass.* Six broaching machines are: Model HP-5, 2½-ton, 30-in. stroke, horizontal hydraulic pull; Model FPC, 2½-ton, 18-in. stroke, vertical hydraulic push; Model DRV, 5-ton, 54-in. stroke, double-ram vertical hydraulic surface; Model HP-15, 7½-ton, 48-in. stroke, horizontal hydraulic pull; Model SRV, 15-ton, 66-in. stroke, single-ram vertical hydraulic surface; Model V-3, special 20-ton, 42-in. stroke, vertical hydraulic pull-down. The seventh machine is the Model HS, 60-in. capacity, 10-in. vertical and cross travel, universal hydraulic broach and tool grinder.



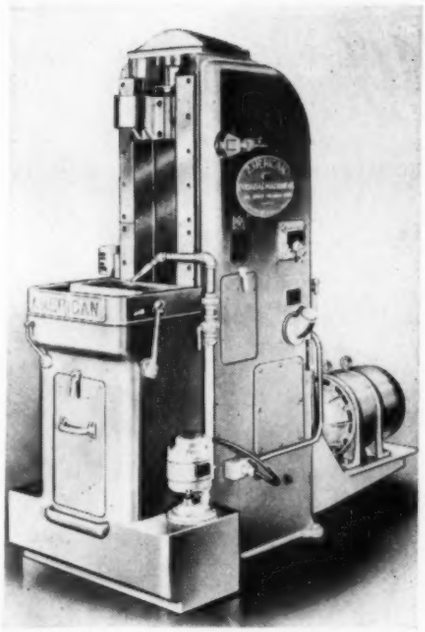
VERTICAL BROACH—*Oilgear Co., 1301-1417 W. Bruce St., Milwaukee 4, Wis.* Vertical Cyclematic broaching machine, type XM-30x54 in., is used essentially for single or multiple broaching of internal holes, splines and special forms where large volume of parts is required.



BROACHING MACHINES — *Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Three lines of improved broaching machines consist of both pull-up and pull-down units as well as a new line of single-ram surface-broaching machines. All units are vertical type.

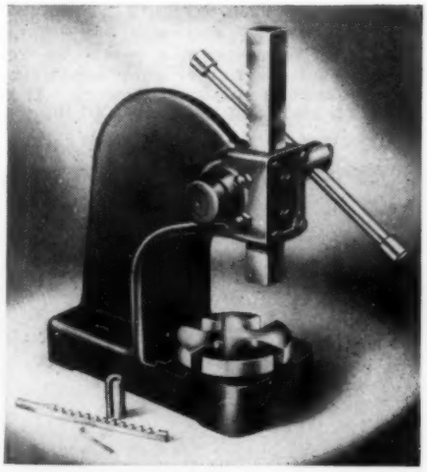


BROACH PULLERS—*Acme Broach Corp., E. 3rd St. at Delaware, Lexington 47, Ky.* Positive-lock broach puller is designed for keyway broaches having notch-type shanks, or broaches of any make provided they have standard notch-type pull ends. Two sizes are: No. 0 for shanks to ¾x¾ in.; No. 1 for shanks to 1½x1½ in.

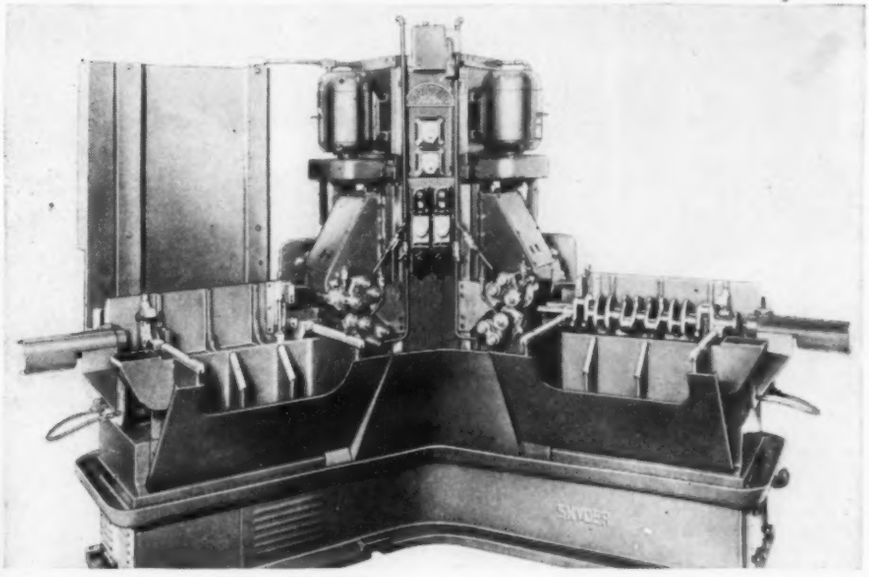


BROACHING MACHINE—*American Broach & Machine Co., 541 W. Huron St., Ann Arbor, Mich.* Improvements in the design of the vertical hydraulic Type T 3-way broaching machine are major change in the coolant assembly, minor changes in worktable. Coolant is now supplied from an enlarged reservoir in the worktable base, and the coolant-discharge pipe extends 8 in. above the worktable with shutoff valve at table height.

BROACH SHARPENER — *Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Operator comfort is emphasized in the design of this broach-sharpening machine. The operator can sharpen flat surface broaches several feet long while seated. Table is 48 in. long with a 36-in. travel. Grinding wheel operates at speeds from 4,000 to 10,000 rpm.



KEYWAY-BROACH KIT—*The du Mont Corp., Greenfield, Mass.* The Minute Man keyway-broach kit is for hand cutting keyways of any standard width and any depth. Broaches, bushings, shims and keyway stock are provided in the kit. The arbor press is also available from du Mont.



KEYWAY CUTTER—*Snyder Tool & Engineering Co., Detroit, Mich.* Two keyways are cut in a large crankshaft at each station of this dual automatic keyway cutter. Work parts are clamped hydraulically, and loading and unloading are performed at one station while the other is in operation.

SURFACE BROACHING — *Oilgear Co., 1301-1417 W. Bruce St., Milwaukee 4, Wis.* The double-slide vertical surface-broaching machine, Type XP-10x54 in., has a new mechanism for operating the shuttle tables. Both tables operate against positive stops on the broach frame to preload the tables prior to broaching. Standard machines have 5- or 8-in. stroke. The wide tools permit broaching a large part or two or more small parts at one time.

BROACHING MACHINE—*Zagar Tool Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* A double-cylinder 360-in. stroke hydraulic broaching machine is designed so that two jobs can be set up at one time. One is worked and the other is left in readiness. Pulling power is 16,000 lb.

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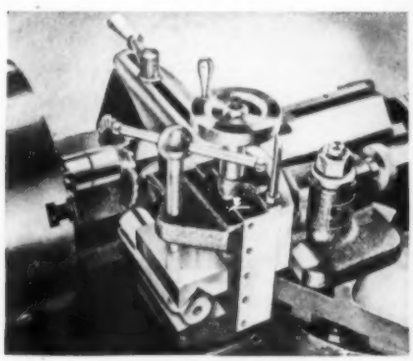
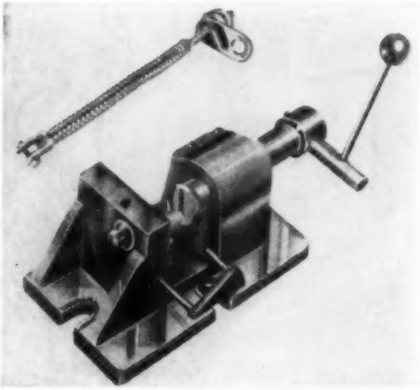
Milling

DIAL-TYPE MILLING — *Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Dual-power and high-power dial-type milling machines, in Nos. 5 and 6 sizes, make up a line of knee-and-column milling machines. The high-power dial types are available in plain, universal and vertical styles, driven by 25-hp. motors. The dual-power machines are driven by 40- or 50-hp. motors and built in plain and vertical styles only.

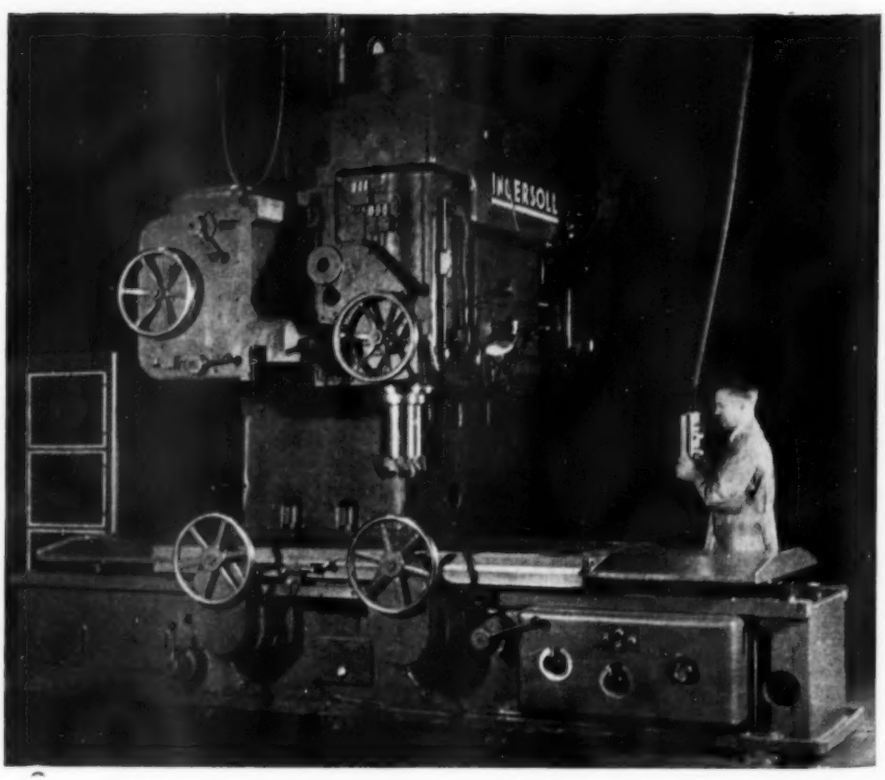


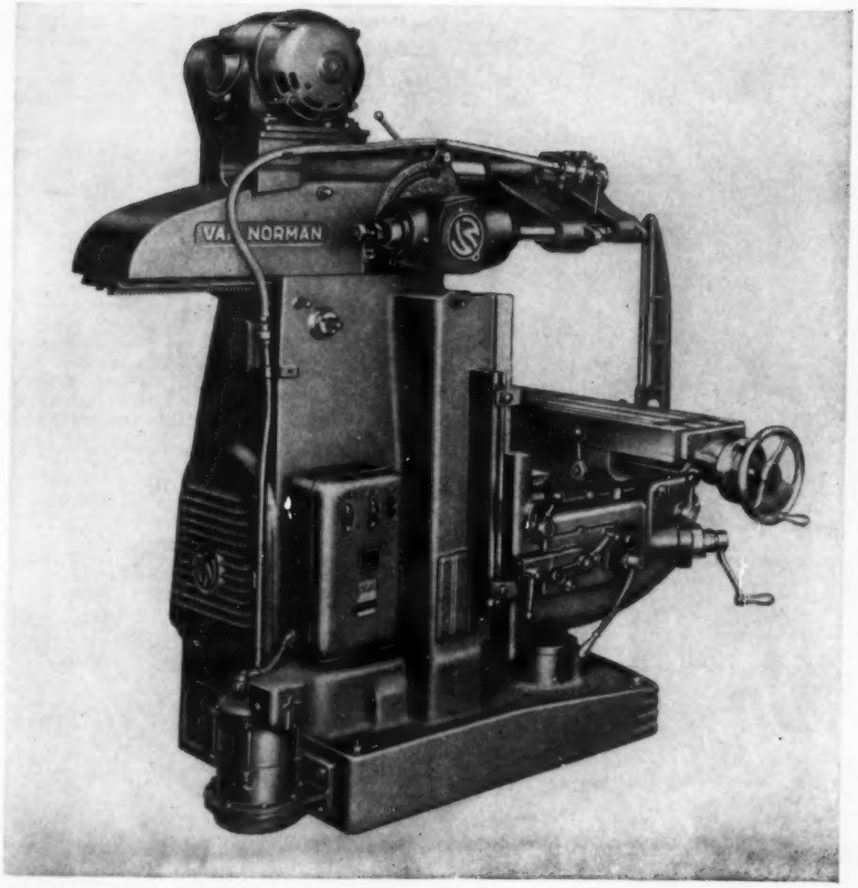
MILLING ATTACHMENT — *Kyle-Johnson Machine Co., 1627 W. Pico Blvd., Los Angeles 15, Calif.* All-steel K-1 milling attachment, a quick-change lathe tool, can be mounted on an engine lathe to perform light jobs including milling keyways, flats and small shafts.



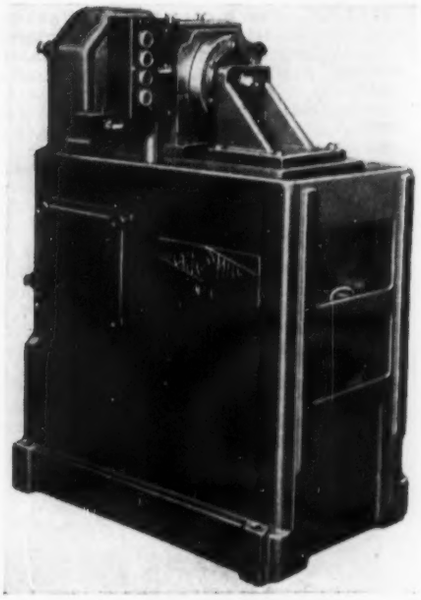
MILLING FIXTURE—*Manufacturer's Engineering Service, Inc., 415-16 Security Bank Bldg., Toledo, Ohio.* "Kam-Grip" milling fixture equipped with two sets of interchangeable anvils and movable jaws, accommodates stock from ⅛- to 1⅛-in. dia. It is 4¾ in. high. A lock-and-release rod permits automatic operation in conjunction with drill press.

VERTICAL-SPINDLE MILLER—*Ingersoll Milling Machine Co., Douglas St. and Willoughby Ave., Rockford, Ill.* Unit is made for a particular job and to suit particular shop conditions in automotive die-making work. It is 12½ ft. high and weighs 80,000 lb.

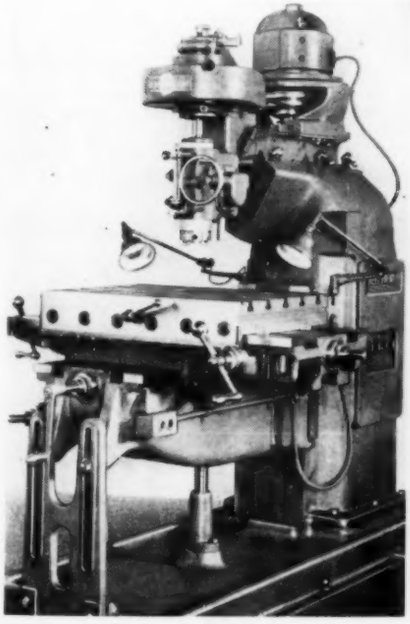




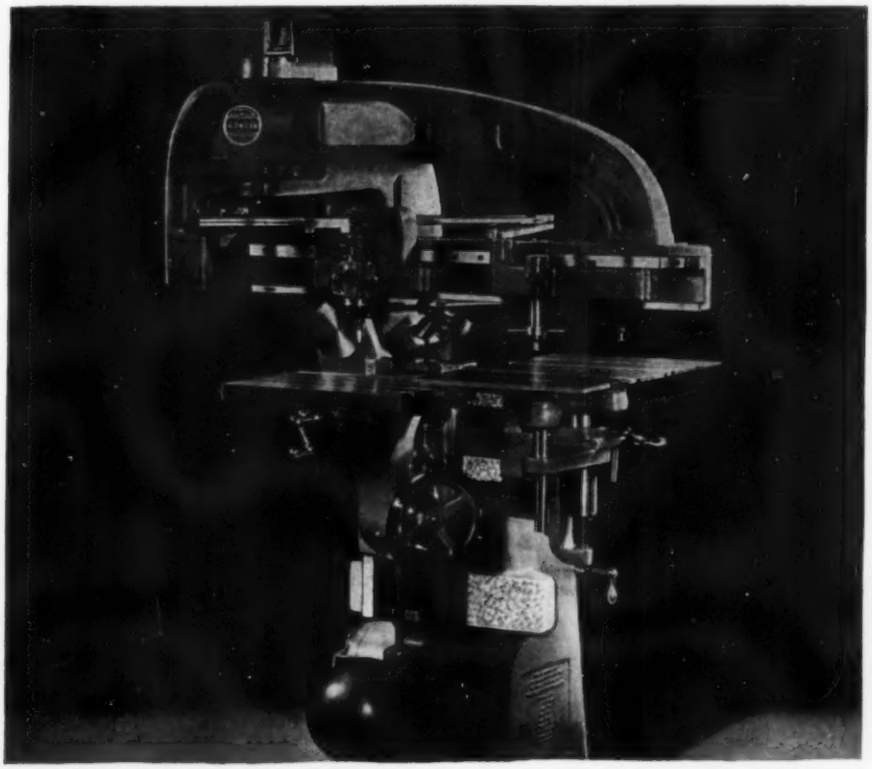
RAM-TYPE MILLER—*Van Norman Machine Tool Co., Springfield 7, Mass.* No. 22M has adjustable cutting head mounted on a movable ram. Horizontal, vertical, or angular milling is possible. 3-hp. spindle motor gives nine speeds from 40 to 1100 rpm.



PLANETARY MILLER—*Plan-O-Mill Corp., 1511 East Eight Mile Rd., Hazel Park, Mich.* Designed for low-cost high-volume thread and form milling, the No. 1 planetary milling machine will mill complete part in a single-operation requiring as little as 8 sec. The machine has facilities for external and internal threading, and will thread and mill parts to 2-in I.D. or O.D., or larger with an offset head.



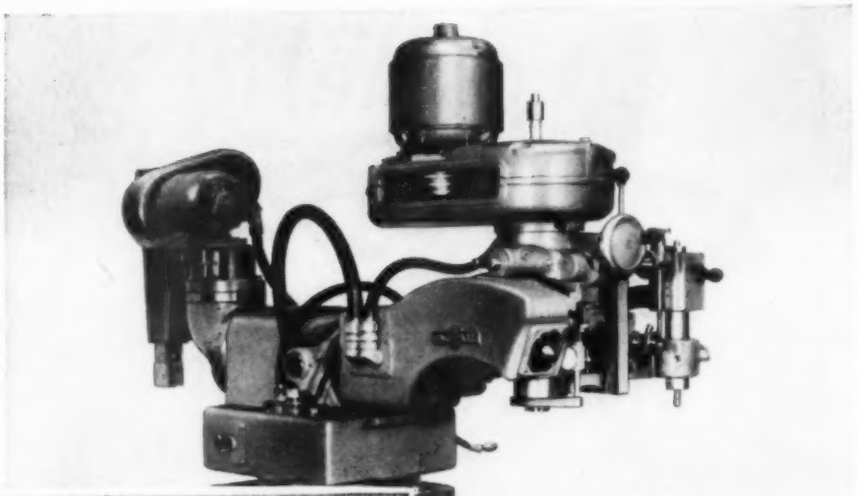
MILLER — *Reed Prentice Corp., Worcester 4, Mass.* Vertical milling and die-sinking machine, No. 22V has a head mounted on ram with 16-in. adjustment. Ten speeds with belt range from 400 to 2600 rpm., and five speeds with back gears from 133 to 320 rpm.



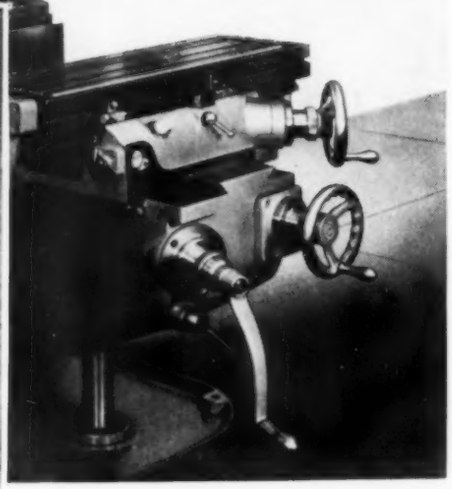
PANTOGRAPH—*George Gorton Machine Co., Racine, Wis.* The P13 three-dimensional pantograph engraving machine with Ratiobar tracer control employs enlarged three-dimensional master or pattern mounted on copy-table and traced manually with the tracing stylus while the cutter reproduces at desired ratio of reduction. Ratiobar puts pivot center, cutter spindle and stylus in a straight line. Only one slider block is used to adjust for whatever reduction ratio is desired. Ratios from 2:1 to 40:1 are available. At 2:1 reduction, the area covered by the cutter point is 4½x9½ in.

MILLING

MILLER—*Cincinnati Milling Machine Co., Cincinnati, Ohio.* 8x18-in. Tool and Die Milling machine, produces plastic molds, permanent molds and metal patterns. Sensitive hydraulic tracer mechanism provides automatic duplication of intricate shapes. Tracer-finger contact pressure permits use of wood, plaster of paris or other soft materials for master shape. →

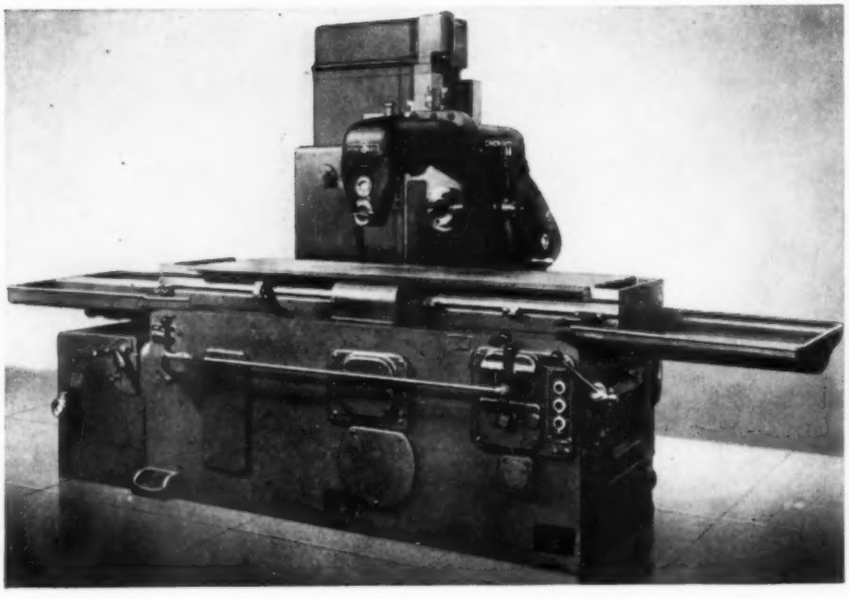


MILLER — *Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.* No. 2 ML, offered in plain and universal styles, is 1000 lb. lighter, is driven by 3-hp. motor (instead of 5-hp.) and has same general features as No. 2 M1 (AM—Aug. 1, 1946, p. 149). Speed and feed ratios are 60:1 and 120:1. There are 16 spindle speeds from 25 to 150 rpm., and 16 feeds from ¼ to 30 ipm. ↓



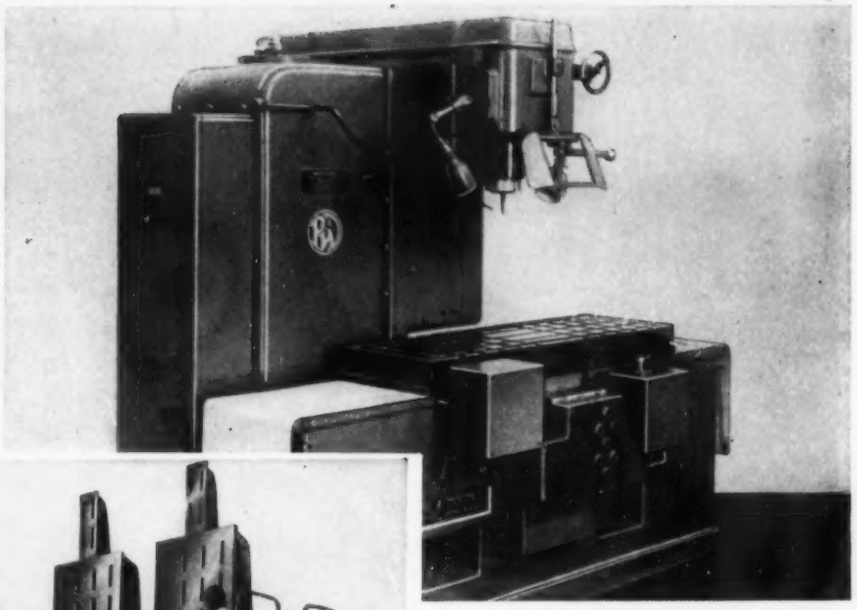
HYDROMATIC MILLERS — *Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Tracer-controlled hydromatic milling machines in 12 sizes are built in plain and duplex styles with table travels ranging from 24 to 90 in. They are heavy-duty, production-type milling machines with a sensitive tracer-controlled vertical movement of the spindle carrier. They have an automatic operating cycle including duplication of master profile templets. ↓

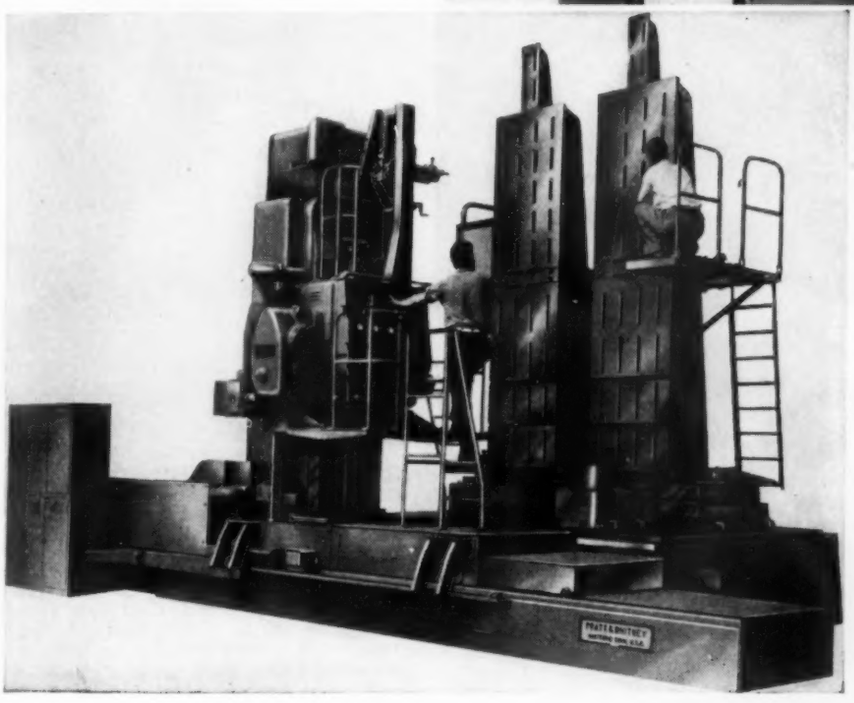
BENCH MILL — *Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif.* Model B-12 bench mill weighing 450 lb. has table 4⅛x20-in. 12-in. longitudinal travel, 9-in. vertical travel, and 6-in. transverse travel. Spindle is equipped with No. 9 B&S taper. Speed range of spindle is from 100 to 1400 rpm.

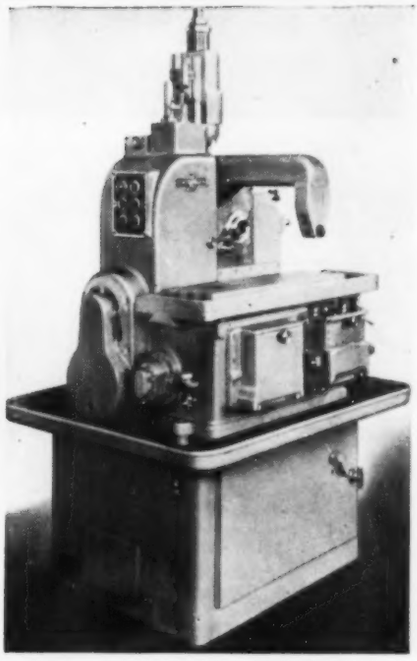


DIE SINKER—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* No. 4D die sinker, featuring Directron control which permits compounding any two components of travel, produces original forging dies, die-casting dies, molds and similar work. Spindle speeds are from 35 to 1750 rpm. Unit illustrated has 16x43-in. table working surface. Tools are manufactured in shank sizes ranging from ⅝x1 to 1 in. square. →

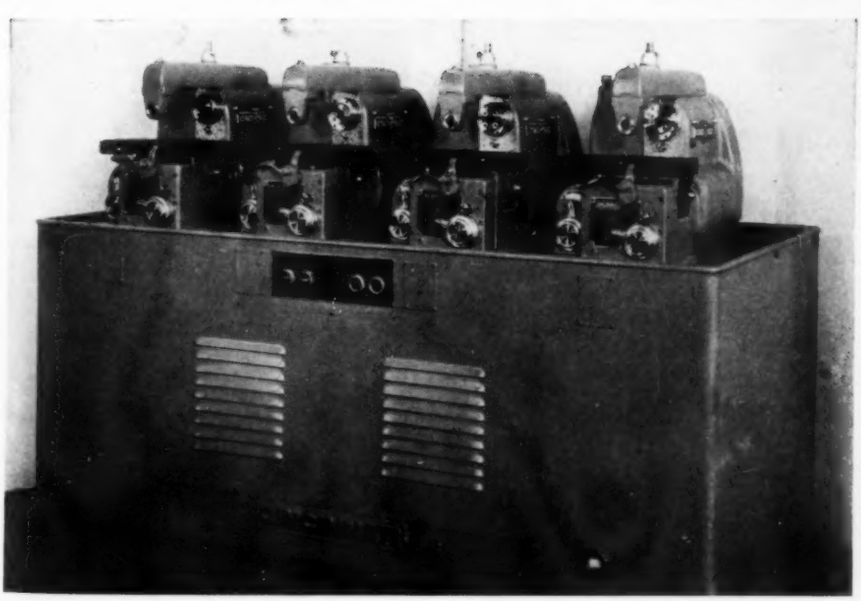
MILLING—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Type BG-22 Keller machine for tracer-controlled milling produces large dies from three-dimensional models, or profiles job in two dimensions. As tracer passes over master form, cutter duplicates its path. Machines automotive body dies 10x5 ft. ↓



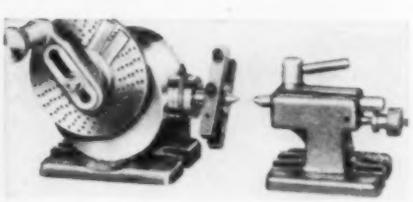




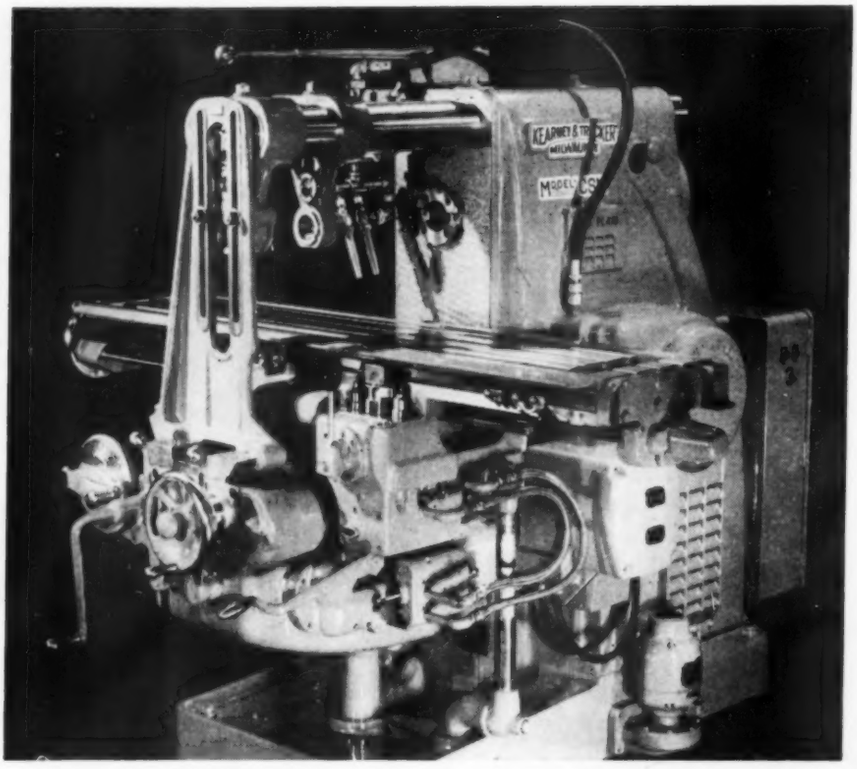
PLAIN AUTOMATIC MILLER—*Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* No. 0-8 is designed for rapid production of small- and medium-sized parts in quantity. Operating cycles are automatic and are changed by pre-set cycle-selector camshafts. There are 20 spindle speeds and 16 feeds.



MILLING MACHINE—*The Cincinnati Milling Machine Co., Cincinnati, Ohio.* No. 000-4 Unit Type milling machine, small production-type unit, is comprised of four individual milling machines mounted on a single base. Four separate operations can be performed progressively. Ranges are from 1 to 40 ipm. for table speed; 500 to 1800 rpm. for spindle speed.



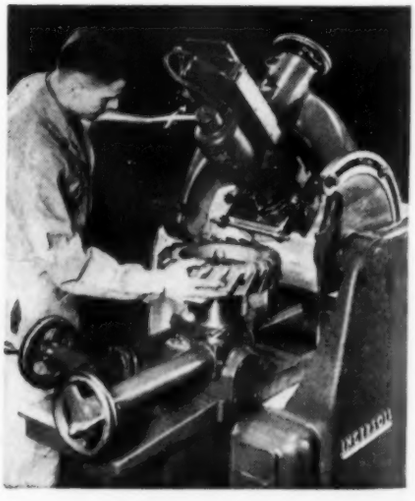
DIVIDING HEAD—*L-W Chuck Co., 25 S. St. Clair St., Toledo, Ohio.* Model SD 6½-in. universal dividing head is for small milling machines. The SD has a tapered bearing and a head tilt of more than 90° in vertical position. Three index plates for up to 380 divisions are included.



AUTOMATIC-CYCLE MILLERS — *Kearney & Trecker Corp., Milwaukee 1¼, Wis.* A complete line of 32 knee-type milling machines, featuring automatic table-cycle control, is designed and built in plain and vertical styles. They are said to effectively combine advantages of knee-type and production-type units. They are available from 3 to 50 hp. A choice of manual or automatic operation is possible to suit requirements of the job. Model illustrated is No. 20 CSM with a feed range of ⅜ to 90 in., speed range of 50 to 1250 rpm., using a 20-hp. motor. Also developed is Model 5D rotary-head milling machine. It is a bed-type machine claimed to possess the most versatile application possibilities ever ← incorporated in a milling machine.

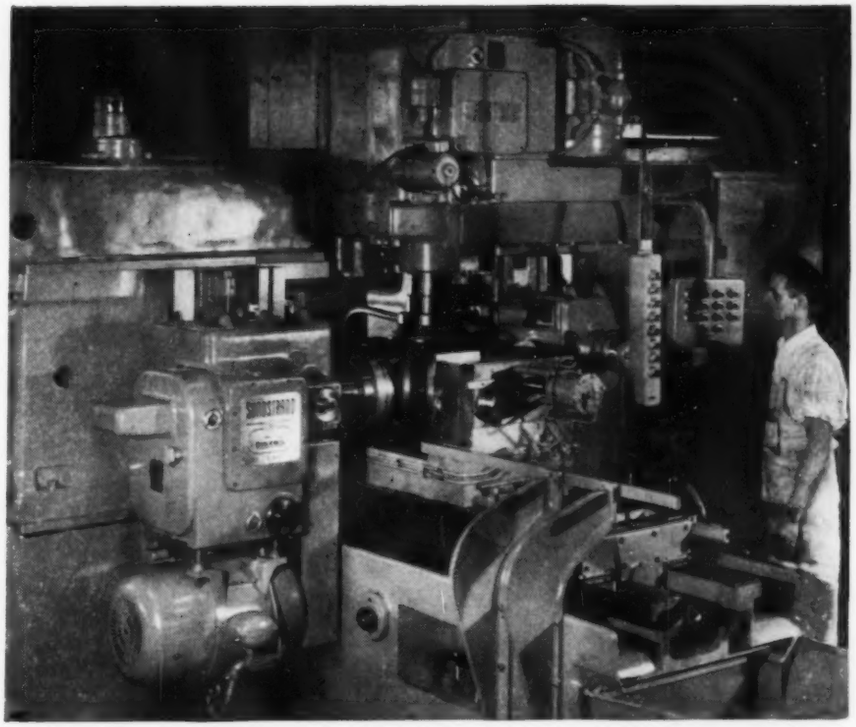
KNEE-TYPE MILLER—*Childs & Co., Conneaut, Ohio.* No. 0000 knee-type milling machine has longitudinal feed of 6 in., traverse of 1½ in. and vertical feed of 4 in. A 0.001-in. tolerance is held by the spindle run-out. The bench unit illustrated is 14½ in. high, can be used on a pedestal. Nine speeds are from 280 to 11,150 rpm. A ½-hp. motor is recommended. The unit weighs 75 lb.

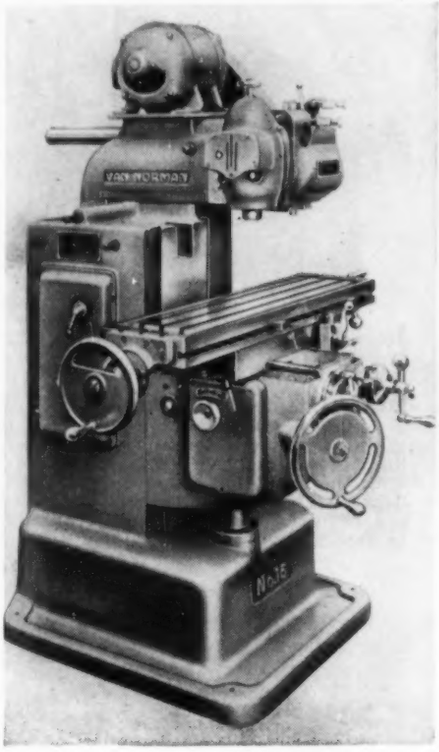
MILLING MACHINE—*Defiance Machine Works, Inc., Defiance, Ohio.* Vertical-spindle milling machine is designed for high production with minimum floor space. Spindle is direct driven by 30-hp. electric motor. Worktable turns at 1 rpm. and is 41 in. in dia. The 12-in. dia. cutter mounts one to 12 teeth and runs at 11,000 sfpm.



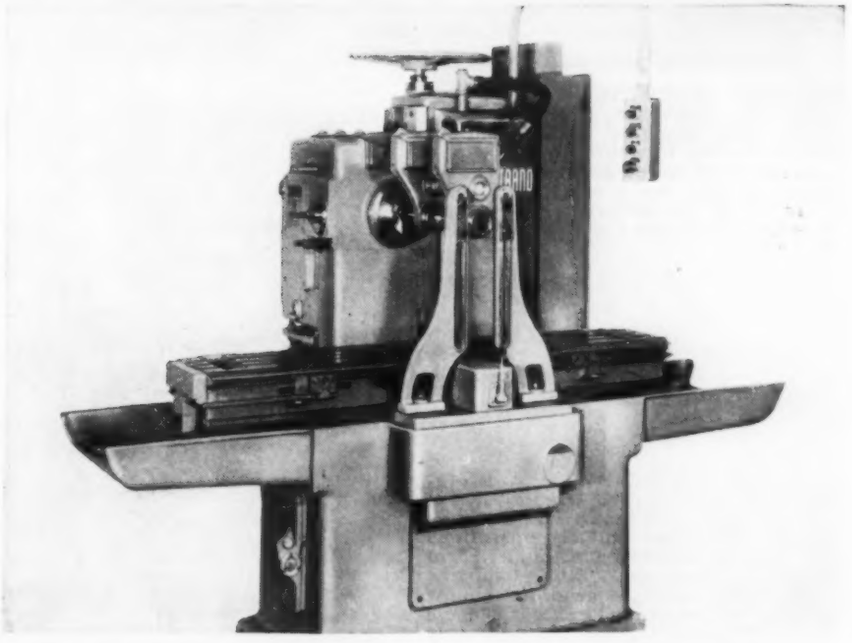
CUTTER GRINDER—*Ingersoll Milling Machine Co., Douglas St. and Willoughby Ave., Rockford, Ill.* Unit grinds periphery, face and corners of cutters in one setting. It provides accuracy by locating the cutter from same center and surface as when in actual use.

TRIPLEX RIGIDMIL — *Sundstrand Machine Tool Co., Rockford, Ill.* A triplex Rigidmil has three adjustable 25-hp. spindle heads. Two of the heads are horizontally opposed, and the third is in a vertical position. Spindles can be operated independently. Machines are available with table widths of 18, 24 or 30 in. and feed strokes up to 144 in. in standard sizes. →



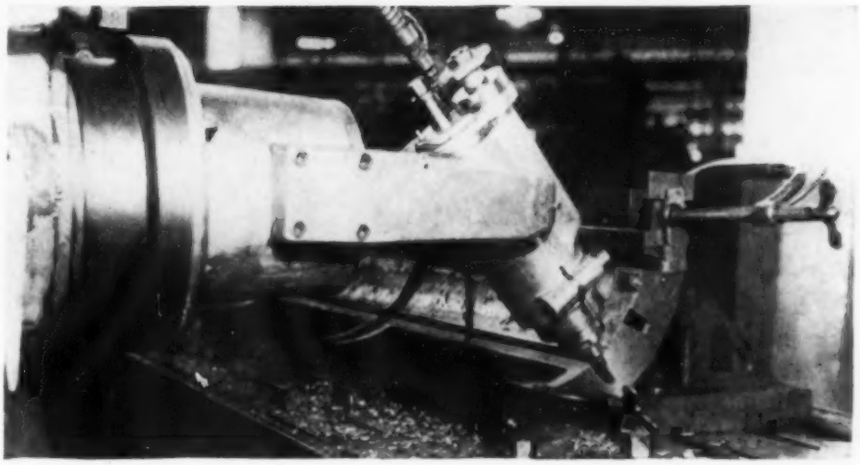


RAM-TYPE MILLER—*Van Norman Co., Springfield, Mass.* Model 16 ram-type milling machine has an adjustable cutterhead and movable ram. It can do horizontal, vertical, as well as angular milling with standard cutters and conventional practices. Power feed is provided for table longitudinal travel of 18 in. Saddle crossfeed is 8 in., and knee vertical feed is 17 in.

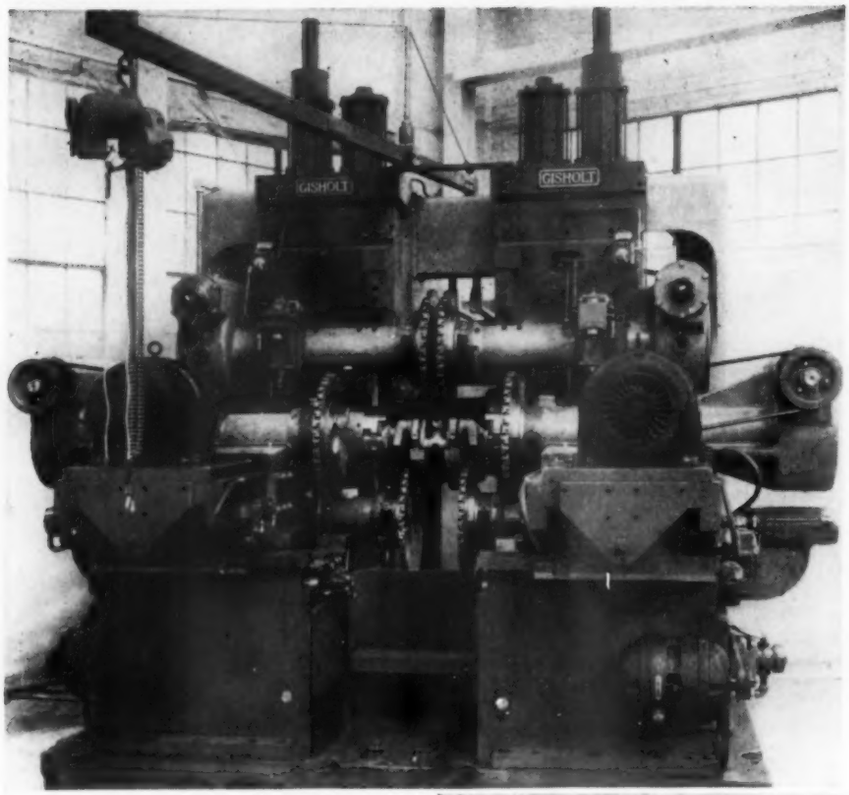


AUTOMATIC RIGIDMIL—*Sundstrand Machine Tool Co., Rockford, Ill.* Model 22 comes in three sizes with 24-, 36- or 48-in. feed stroke. Spindle heads have 80:1 ratio between high and low speed, and heads are independently driven by 7½-hp. motor. →

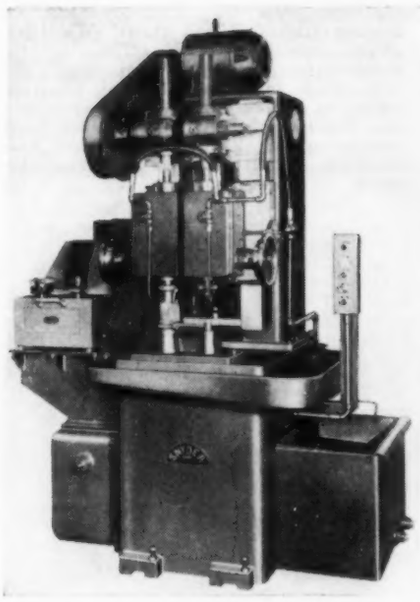
SPECIAL MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* Special machine is designed for milling of locating spots on auto cylinder heads. Two loaded fixtures automatically index into work position. The dual-spindle milling heads feed cutters across two bosses on each of the two workpieces, and then cutters rotate and mill the remaining two bosses on each piece.



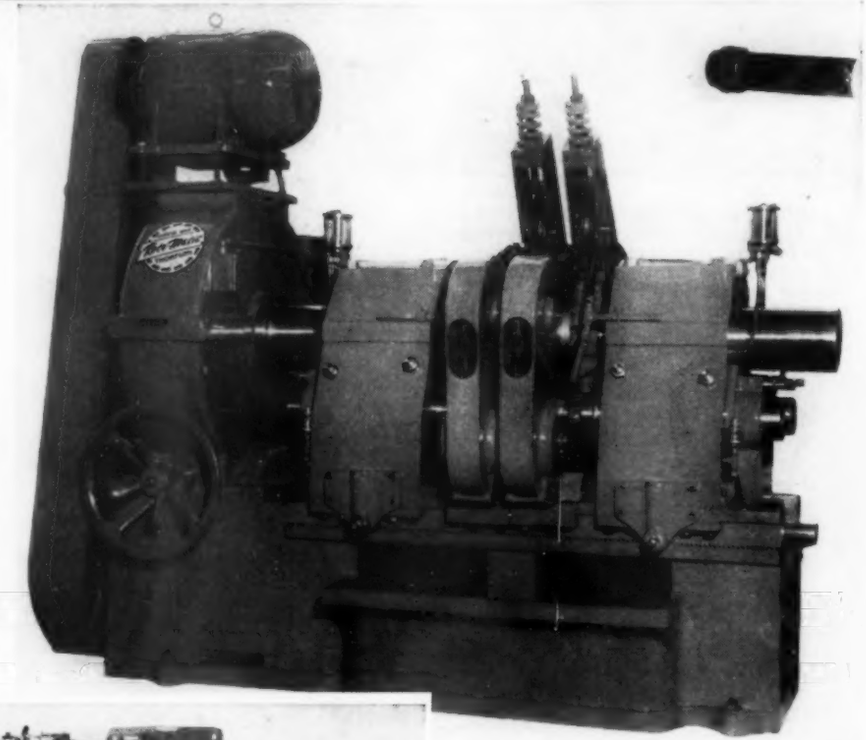
UNIVERSAL MILLING ATTACHMENT—*Defiance Machine Works, Inc., Defiance, Ohio.* Unit mounts on Nos. 25-A and 26 horizontal boring mill. With a rotary table it is possible to mill four sides of a piece and the top at one chucking. Either slots or surfaces can be milled at an angle. Takes 2½-in. dia. facing cutter, and runs at speed of boring-mill spindle. →



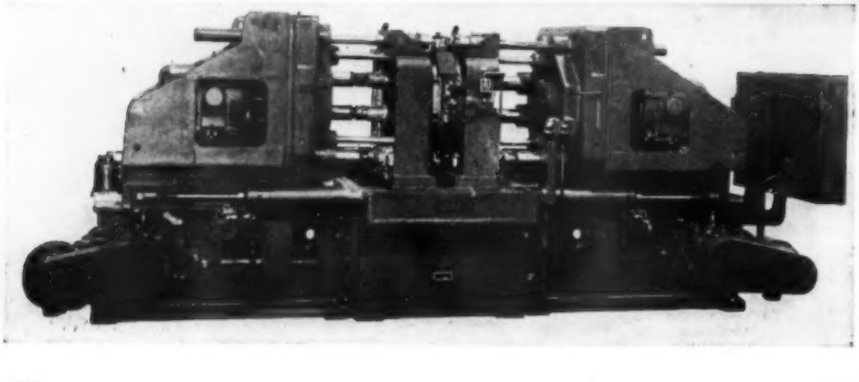
MILLING MACHINE—*Gisholt Machine Co., Madison 3, Wis.* A special turn-milling machine is designed to simultaneously turn mill all the crankpins and face the adjacent cheeks and counterweights on a crankshaft to a finish ready for grinding. It weighs 50 tons. There are six 24-in. dia. milling cutters.



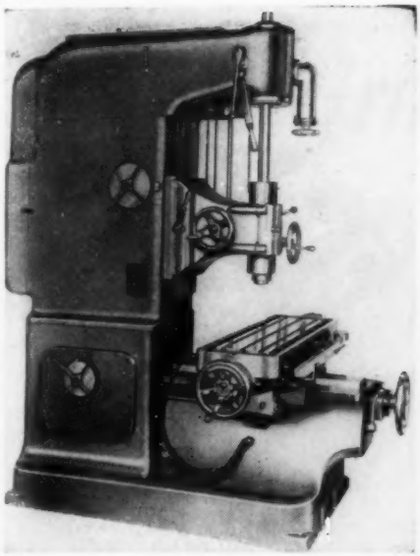
ROD BALANCER—*Snyder Tool & Engineering Co., Detroit 7, Mich.* It makes possible automatic balance milling of automotive connecting rods, with the exception of setting quills for depth. Two 16-sec. machining cycles are required for each rod. Clamping is automatic.



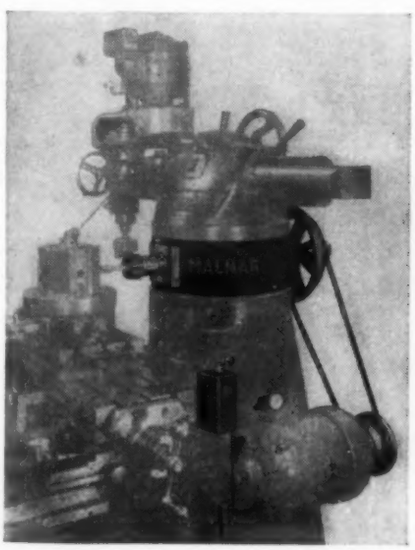
SPECIAL MACHINE—*Baker Brothers, Inc., Post & W. Lake Sts., Toledo 10, Ohio.* Model 30 HH two-way opposed floor-type unit for operations on steering-knuckle pin, upper arm support. Each unit has 4-spindle, fixed center multiple head for hollow milling and chamfering. Heads have two additional drivers for operating lead-screw spindles for external threading. Two pieces loaded at first of four stations on hand-indexed trunnion. Station 2, ends chamfered; 3, O.D. turned; 4, parts threaded.



ROTO-MATIC — *Davis & Thompson Co., 6411 W. Burnham St., Milwaukee 12, Wis.* Roto-Matic machines are designed for continuous operation. Various units include Nos. 1-A and 2-A continuous, rotary, double-end, drum-type milling machines; 8 LV vertical, 8-spindle, continuous drilling machine; and 12 V vertical, 12-spindle, continuous drilling machine. Unit illustrated is similar to No. 1-A.

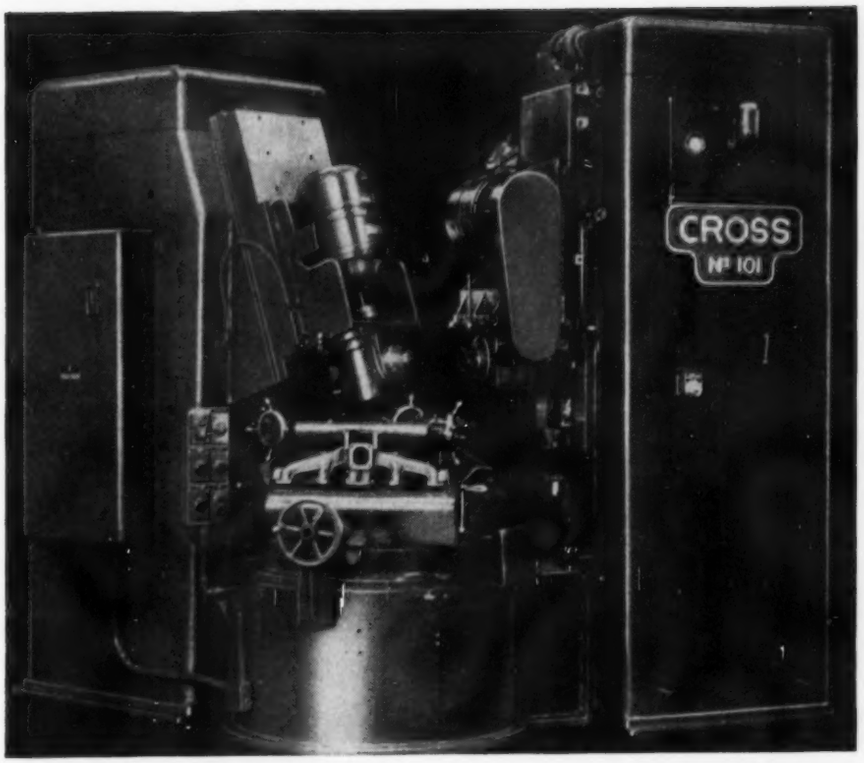


MILLING MACHINES—*W. B. Knight Machinery Co., 3920 West Pine Blvd., St. Louis 8, Mo.* No. 50 Miller is a solid-base type machine for vertical milling and precision boring. Also developed is the Elec-Tro-Mill, available as a standard machine for different types of work, or furnished with built-in units for specific applications. The electronic drive offers infinitely variable speeds and feeds for the spindle and table.



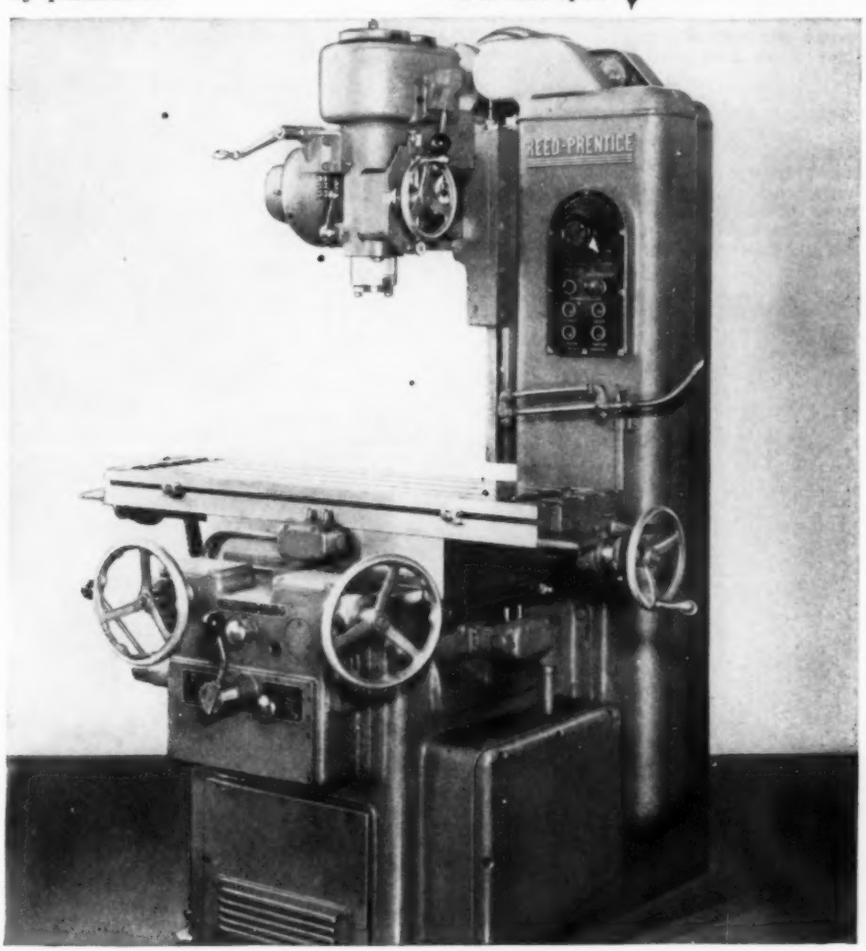
HORIZONTAL UNIT—*Malnar Machine & Tool Co., Inc., 19301 St. Clair Ave., Cleveland 10, Ohio.* Permanent horizontal unit is for Bridgeport turret milling machines. All jobs are done on one set-up: vertically by Bridgeport and horizontally by Malnar. It is designed for heavy end-milling, fly-cutting, drilling and other operations.

ATTACHMENTS—*Malnar Machine & Tool Co., 19301 St. Clair Ave., Cleveland 10, Ohio.* An arbor support for horizontal milling on a Bridgeport is used in conjunction with the "Malnar Horizontal Unit." The operator now can do end horizontal milling with the Malnar. Also announced is variable-speed unit for use with "Horizontal Unit." Spindle speeds can be varied from 10:1 reduction on a constant-drive pulley setup.

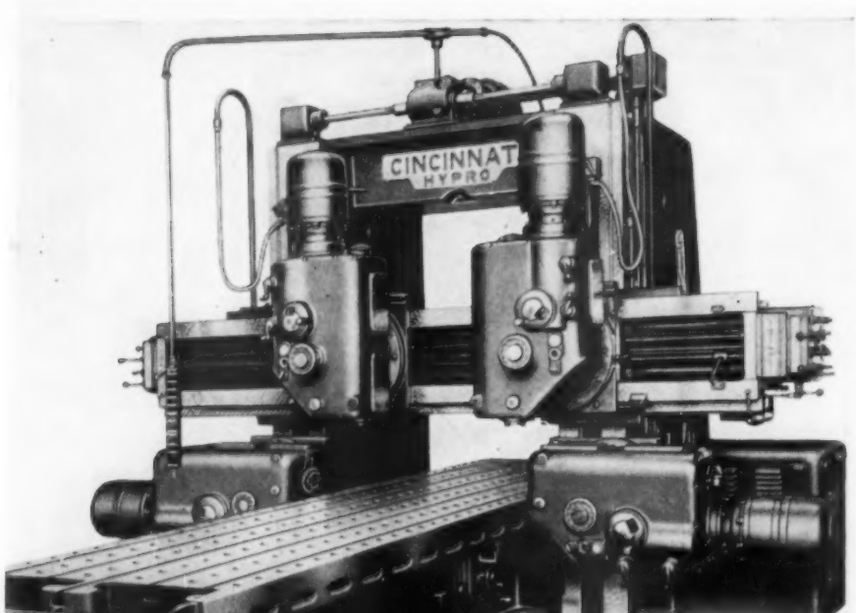


SPECIAL MACHINE—*The Cross Co., Detroit, Mich.* Unit mills tail-pipe flange and intake-manifold joint face on exhaust manifold. Unit has three stations with power indexing, produces 110 pieces per hr. Carbide cutters used. Control (except clamping) by pushbutton.

MILLER — *Reed - Prentice Corp., Worcester 4, Mass.* Universal-head milling and die-sinking machine, No. 12V, for toolroom work. Head can be adjusted for all angles to 45° front and back, and 30° left to right. Spindle speeds are infinitely variable from 90 to 2200 rpm.



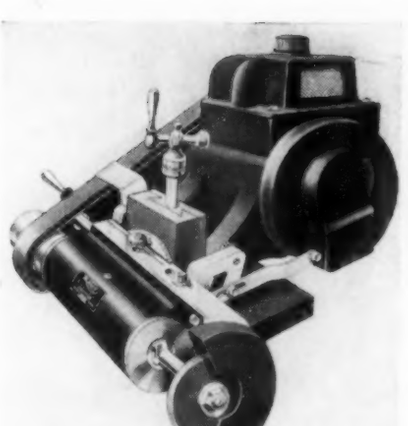
MILLING



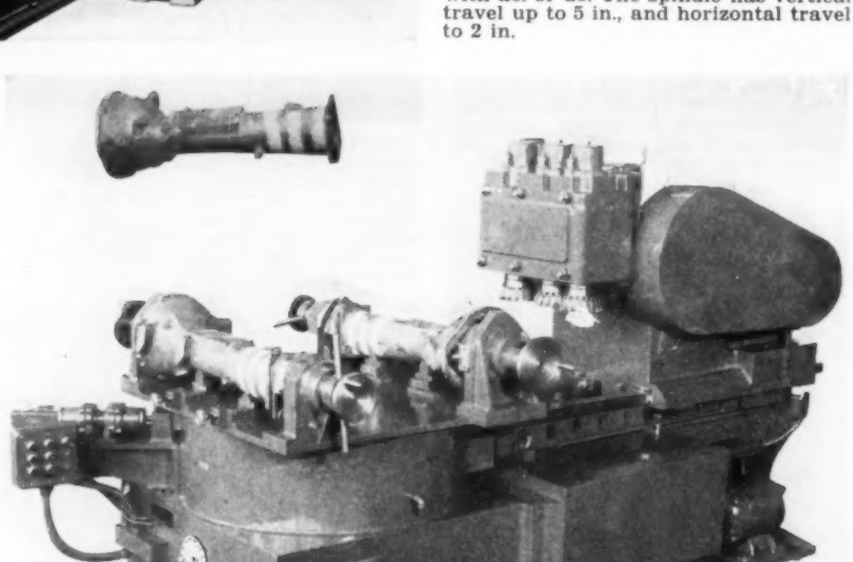
PLANER-TYPE MILLER—*Cincinnati Planer Co., Cincinnati 9, Ohio.* Among improvements in the 48 in. × 12 ft. Hypro planer-type milling machine, is electronic head and table drive.

VERTICAL MILLING MACHINE—*Davis & Thompson Co., Milwaukee 14, Wis.* Type VMI has been adapted to production milling of two top pads on a clutch housing. Produces 40 to 80 pieces per hr. Automatic cycle starts after work has been loaded. →

INDEX-TYPE MILLING—*The Cross Co., Detroit, Mich.* Machine handles exhaust and intake manifolds. There are three stations: at first station parts loaded and unloaded; second station, back of flanges milled; third station, stud clearances form milled. 93 pieces can be produced per hr. ↓



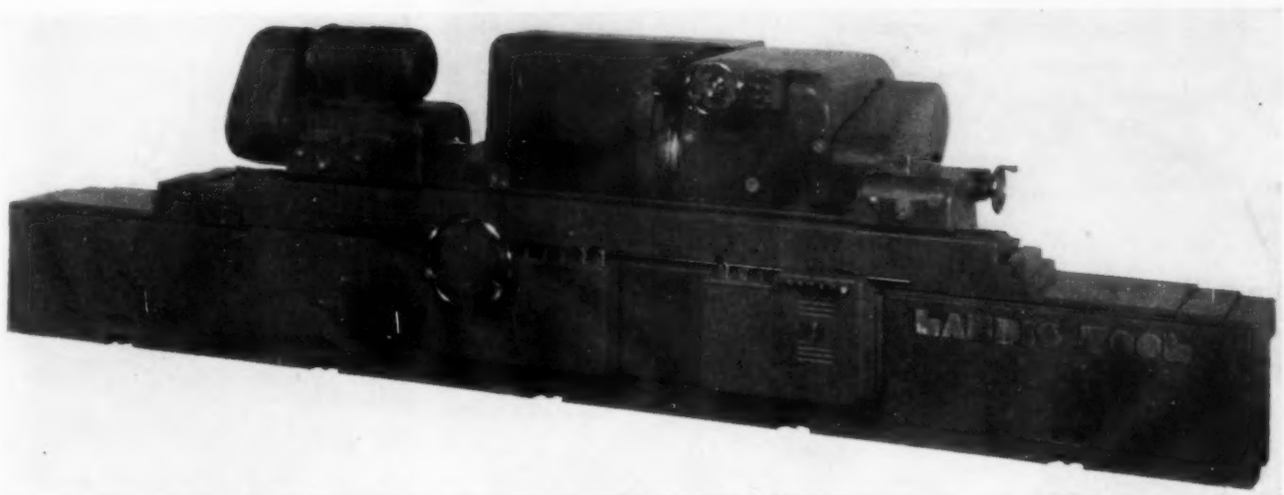
UNIVERSAL UNIT—*Koett Universal Inc., Oneonta, N. Y.* Self-contained unit for milling, grinding, boring and dovetailing can be mounted on a drill-press, milling machine or lathe. Speeds may be varied from 500 to 40,000 rpm., with ac. or dc. The spindle has vertical travel up to 5 in., and horizontal travel to 2 in.



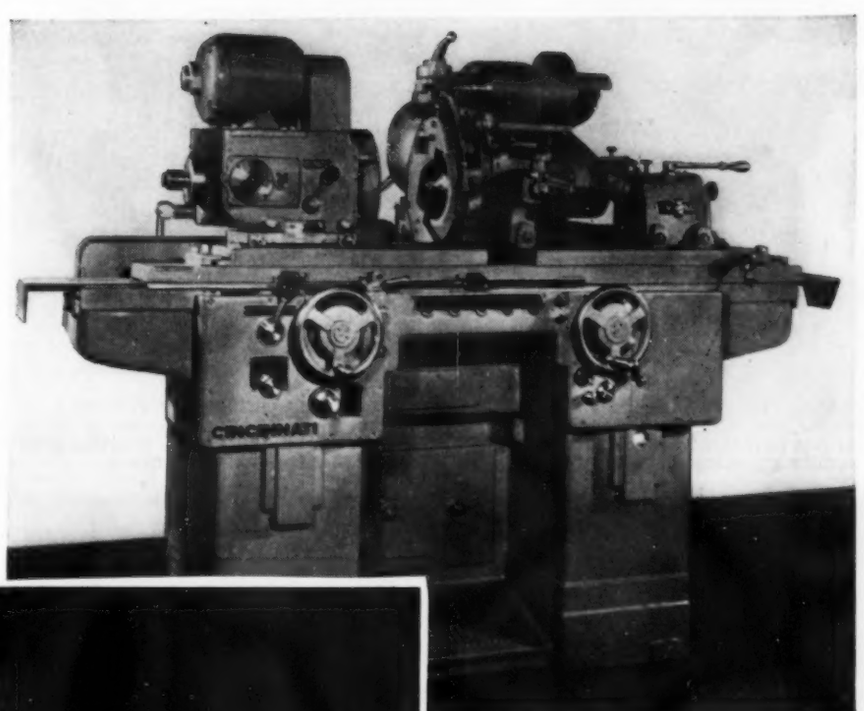
ENGRAVING, PROFILING—*Airdraulics, Inc., 100 W. 101st St., New York 25, N. Y.* Automatic engraving and profiling machine is designed to handle almost any type of material. Machine does profiling on a 1:1 ratio. It is supplied with a Pantograph which permits engraving at a standard reduction ratio of 3:1. Adjustable vise holds work to 5x8 in.

AMERICAN MACHINIST 35th ANNUAL REVIEW

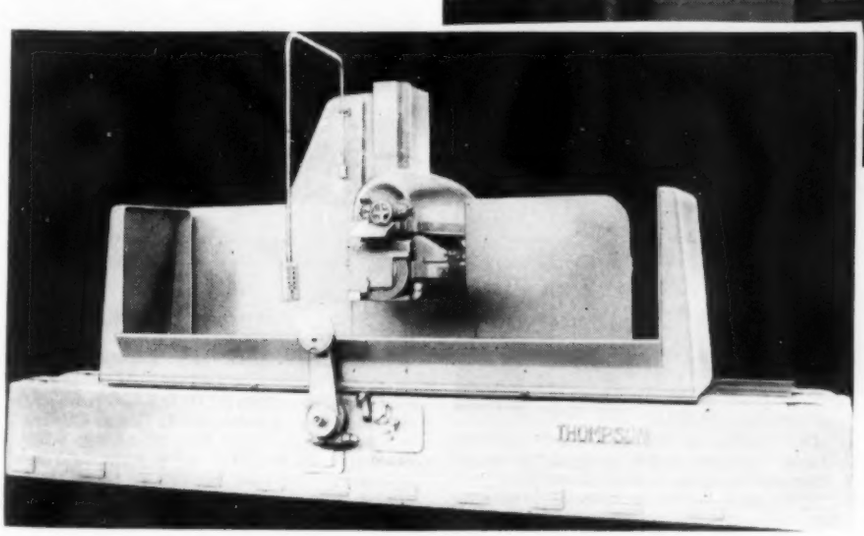
Grinding, Honing, Lapping



HYDRAULIC GRINDER — *Landis Tool Co., Waynesboro, Pa.* Type F plain hydraulic grinder, has weight-carrying capacities of 6,500 or 10,000 lb. and is available in plain, gap, and roll grinder designs. The swing on the basic machine is 16 in., but the machine can be furnished with 14 in. or raised to swing 20, 24, 30 or 36 in. Nine lengths give distances between centers of 48 to 240 in. Wheel diameters on the machine can be 30 to 36 in., or 42 in.

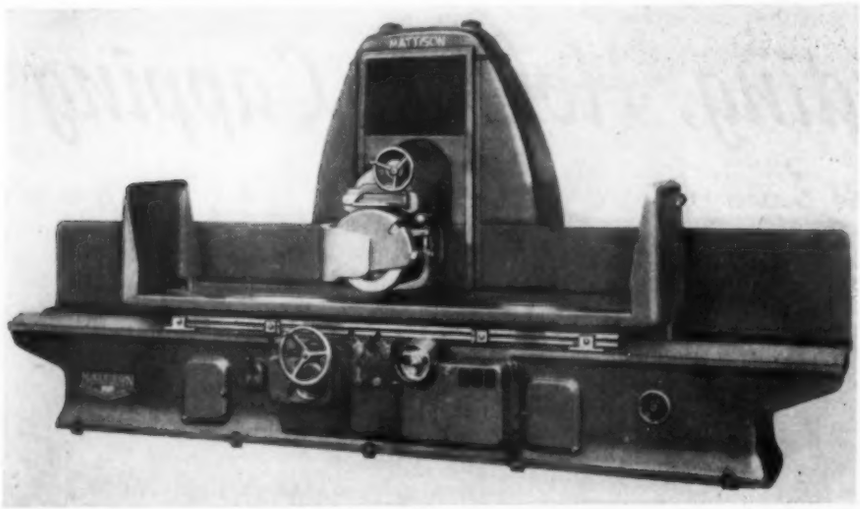


HYDRAULIC SURFACE GRINDER —*Thompson Grinder Co., Springfield, Ohio.* Type CX 36x48x120 has a "super-precision" spindle powered with 40-hp. motor and is designed for heavy stock removal on large areas to the degrees of finish and accuracy required for machine-tool bearing surfaces. ↓

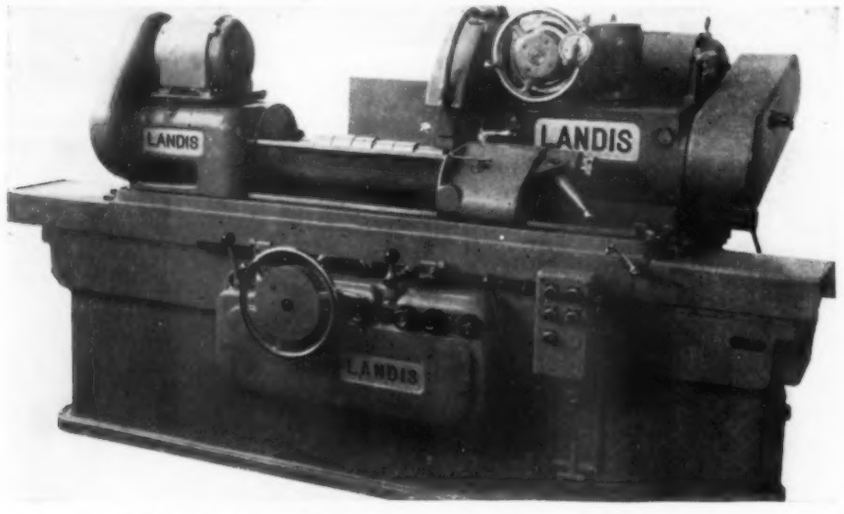


UNIVERSAL GRINDER—*Cincinnati Grinders, Inc., Cincinnati 9, Ohio.* Filmatic 10-in. hydraulic universal grinding machine is available as precision toolroom or production grinder with universal features. Built in 24-in. length only. Internal grinding capacity ranges from ⅞- to 1½-in. diameter by 2½ in. deep, with standard quill and wheel.

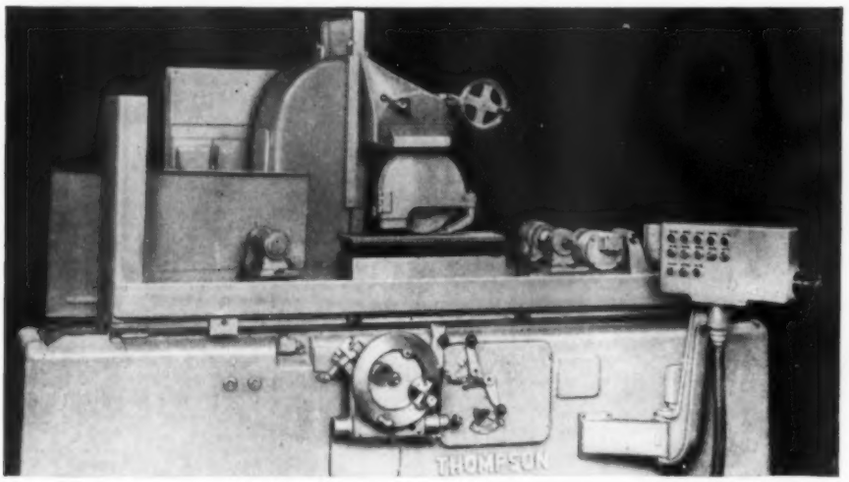
AUTOMATIC—*Jones & Lamson Machine Co., 160 Clinton St., Springfield, Vt.* The 6x30 automatic multi-rib thread- and form-grinding machine has electrical and hydraulic controls and improved mechanical design.



SURFACE GRINDERS — *Mattison Machine Works, Rockford, Ill.* High-powered precision surface grinders with hydraulic feed will handle regular flat work, also will do unusual grinding work such as castings weighing to 5 tons. V-type and flat ways, contour work, shoulders and edges can be ground. Table sizes range from 12 to 36 in. wide and 36 to 192 in. long.



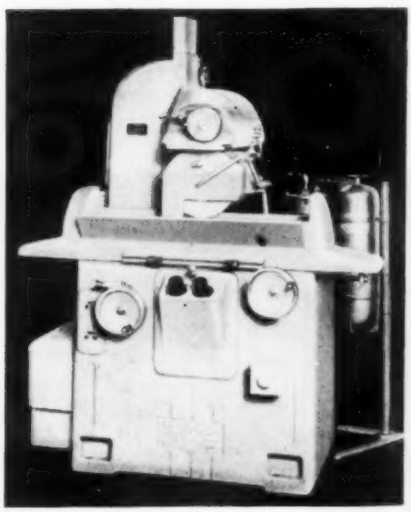
PLAIN HYDRAULIC GRINDER—*Landis Tool Co., Waynesboro, Pa.* Type CH has new multiple-stop device which permits grinding several different diameters consecutively by referring to dial on feed handwheel. Built in 6- to 10- and 14-in. swing; lengths give 18 to 120 in. between centers.



GRINDER—*Thompson Grinder Co., Springfield, Ohio.* Truforming grinder for crushed-wheel grinding, Type B 12x11x36, is arranged for production grinding of intricate contours, such as flat form tools, serrated milling cutters, tangent-type thread chasers. It has automatic wheel crushing, regrinding and reproduction of crushing rolls and automatic size control.

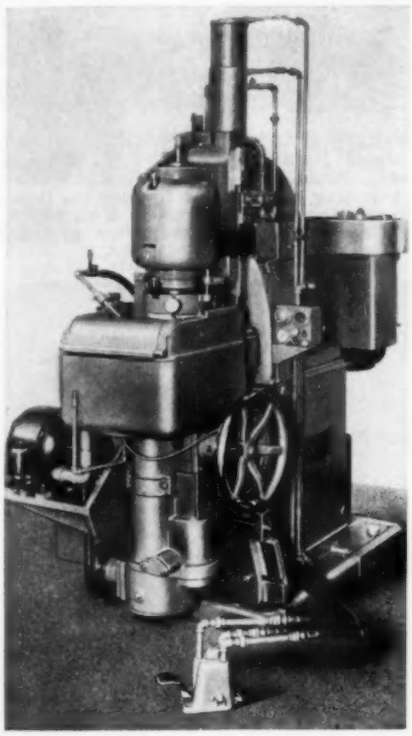
FLAT SURFACE GRINDERS—*Gardner Machine Co., Beloit, Wis.* Two flat surface grinding machines are of new design. One is a special double-spindle grinder, No. 626-26 in., built for parallel surfacing operations. Parts having parallel flat surfaces will pass between opposed abrasive members in a constant stream, one piece following the other. The second is No. 526-26 in., single-head grinder with power-operated oscillating worktable. Grinding head is mounted on power-actuated slide.

SURFACE GRINDER — *Brown & Sharpe Co., Providence, R. I.* No. 2 has larger column for increased rigidity and weighted idler pulley in the base to maintain correct belt tension. Available with either 1½-hp. motor in the base or 1-hp. motor driving the spindle directly.



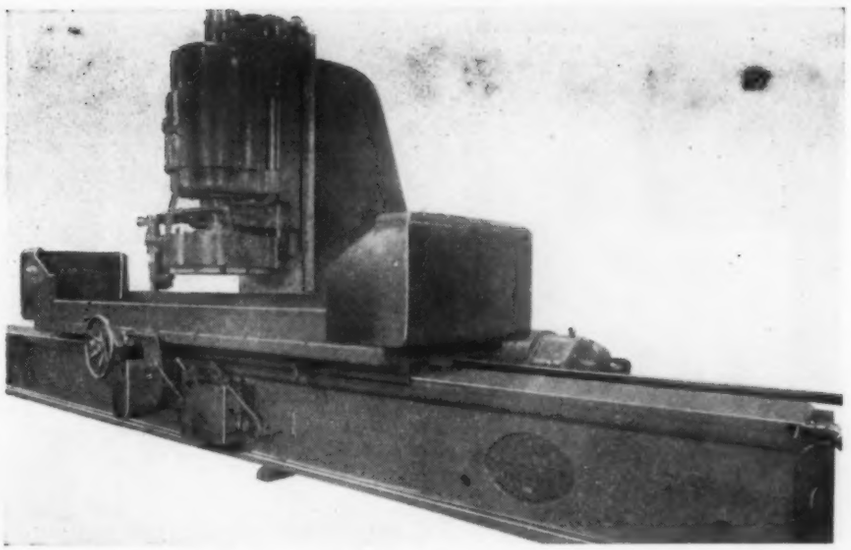
SURFACE GRINDER — *Thompson Grinder Co., Springfield, Ohio.* Coolant is applied through the grinding wheel in Type F 6x10x18 hydraulic surface grinder. Method makes it possible to grind extremely thin sections without burning work.

GRINDERS—*Gallmeyer & Livingston Co., Grand Rapids 4, Mich.* The No. 20, 6x11x17-in. cabinet-base hand-feed surface grinder is available with a 1-hp., 3450-rpm. motor mounted directly on the grinding-wheel spindle, or with an alternative drive. Machine has 20-in. longitudinal table movement and 6¾-in. transverse movement. G & L have also redesigned their No. 4 knee-type universal cutter and tool grinder.



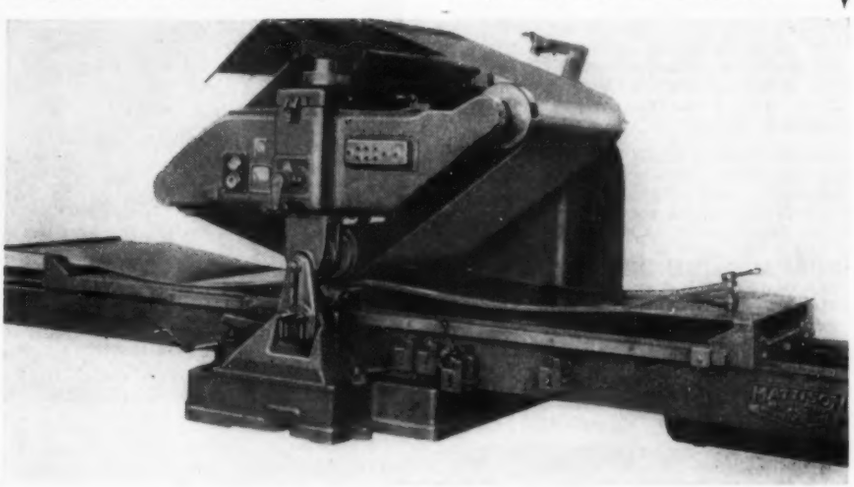
VERTICAL-STROKE GRINDER—*O. S. Walker Co., Inc., Worcester 6, Mass.* Vertical-stroke grinder has hydraulic control of spindle. The spindle rapid traverses to predetermined point, feeds slowly under uniform pressure while the wheel grinds. Control of cycle is by treadle. A wheel to 12-in. dia. can be used with work to 4 in. high.

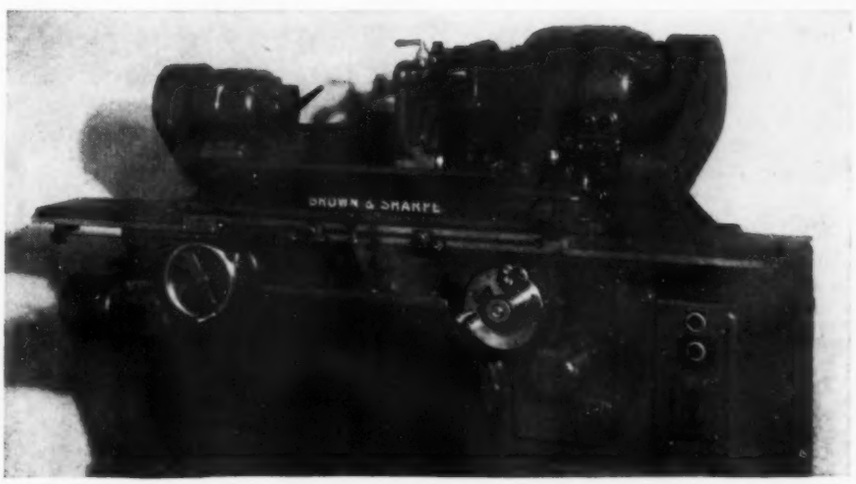
UNIVERSAL GRINDER—*Norton Co., Worcester 6, Mass.* A universal grinding machine, 10x20 in., has both internal and external spindles. Wheelhead rotates 360°. The table mechanism is fully hydraulic. Headstock and footstock can be interchanged. Headstock speeds are 50 to 500 rpm.



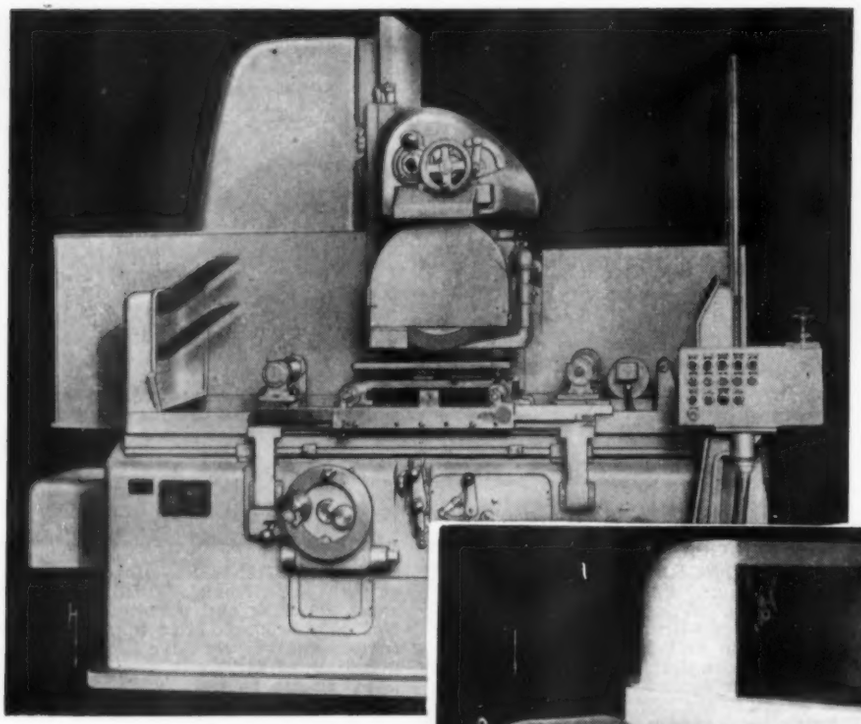
SURFACE GRINDER — *Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn.* A hydraulic vertical surface grinder with a reciprocating table 20 in. wide and 100 in. long is completely hydraulic. It is available with tables from 60 to 240 in. Table speeds to 200 fpm. are available. An electronic sizing device can be furnished.

SHEET GRINDER—*Mattison Machine Works, Rockford, Ill.* Wide-belt sheet grinding and polishing machine, No. 455, designed for application of factory-coated abrasive belts to the grinding of stainless steel and other alloy sheets to 6 ft. wide and 16 ft. long. The abrasive belt is automatically controlled and oscillated.

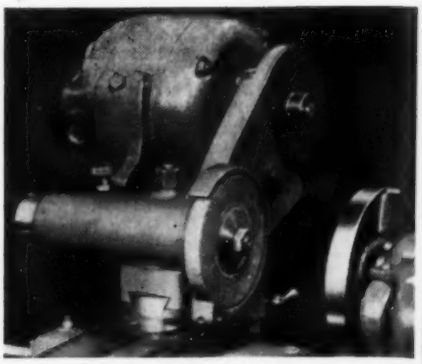




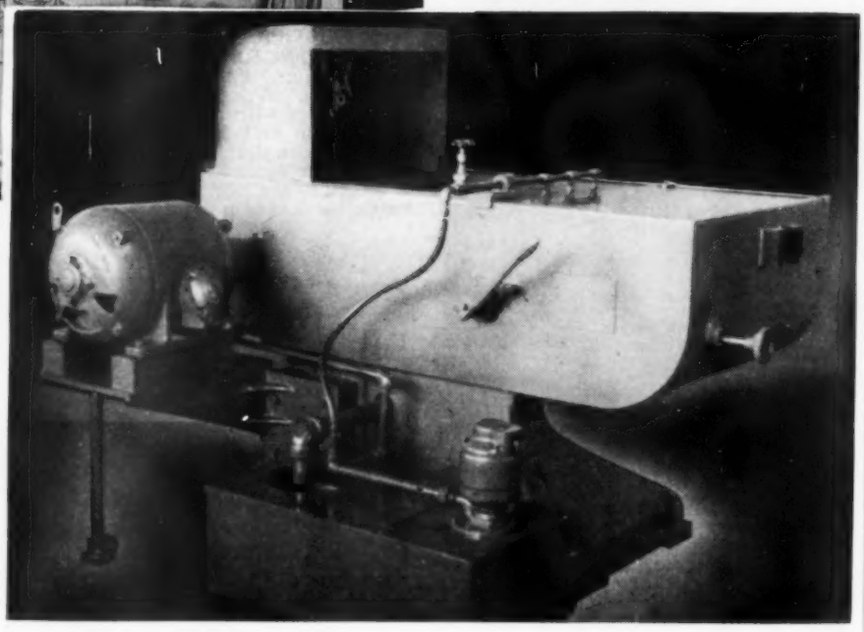
GRINDING MACHINE—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* The electrical controls of No. 5 plain grinding machines are now fully enclosed in compartment on right side of machine. Pushbutton on outside of the compartment controls starting and stopping of motors for entire machine. Magnetic controls, individual-motor overload relays, transformer for control system and mainline disconnect switch are mounted inside.



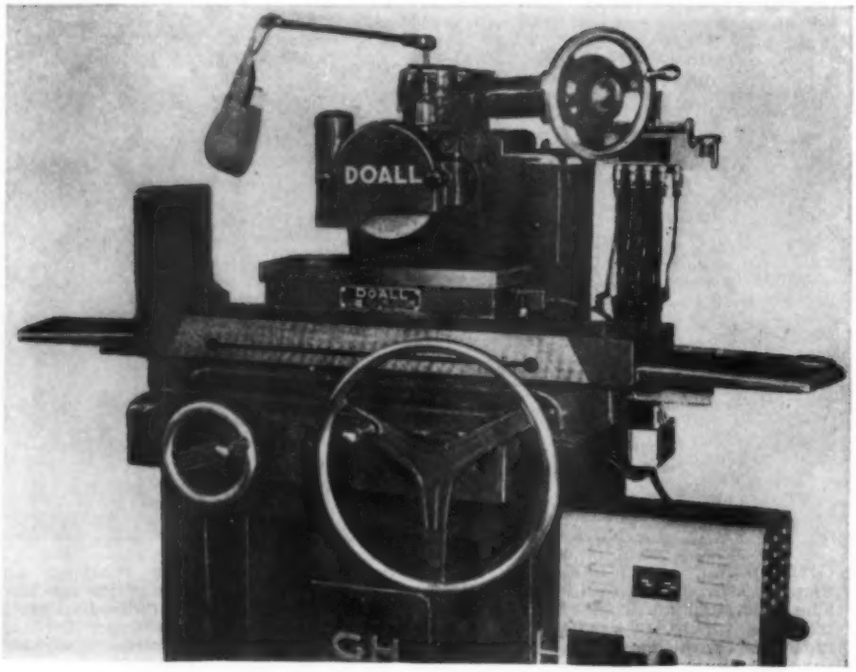
GRINDER—*Thompson Grinder Co., Springfield, Ohio.* Truforming grinder for crushed-wheel grinding, Type C 16x16x36, is arranged with thread-roll-die grinding fixture, equipped with a 20-in. dia., 6-in. face wheel driven by a 30-hp. motor.



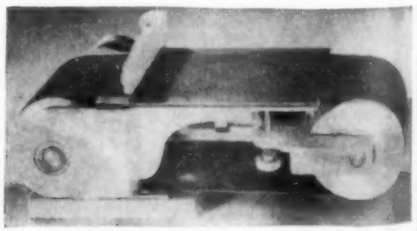
GRINDING ATTACHMENT — *South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* An electric grinding attachment for use on lathes and other machine tools is driven by ¼-hp. constant-speed motor and has a 4x½-in. grinding wheel.



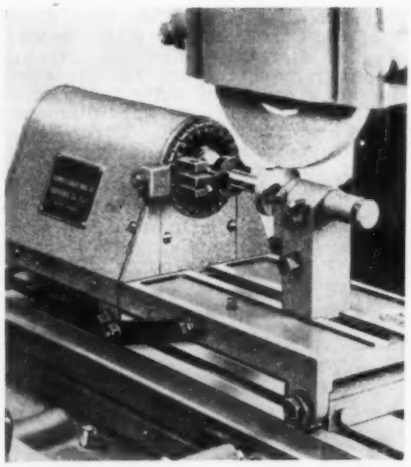
SURFACE GRINDER—*The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Model GH hand-operated surface grinder has standard 7x½x1¼-in. grinding wheel, working area of 6½x19¾ in. with maximum work height of 12 in. Table action is produced by a 16-in. handwheel. ↓



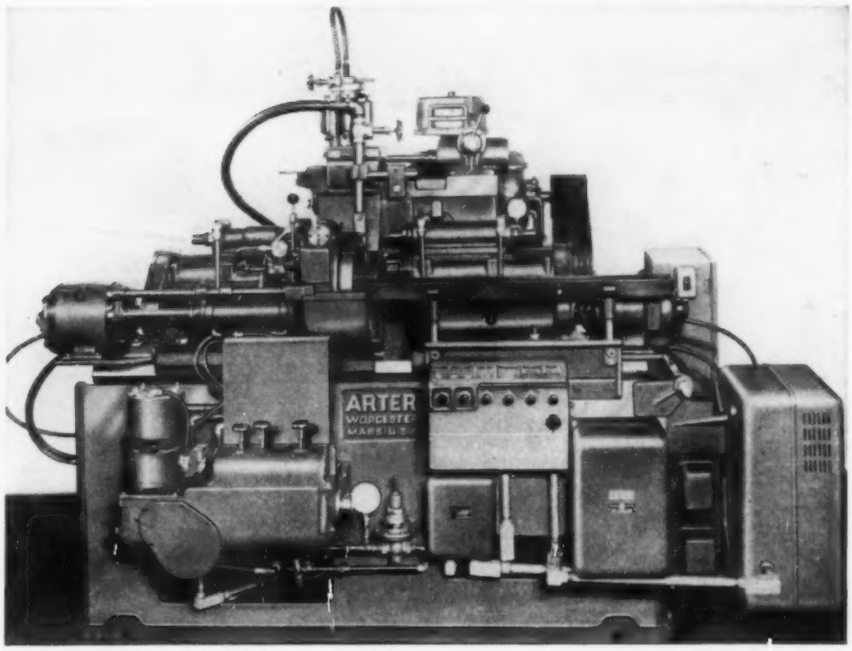
SURFACER—*Production Machine Co., Greenfield, Mass.* 20-in. Peerless horizontal wet- or dry-belt surfacing machine has working surface of 20x30 in. Used for flat surfacing die castings, plastics, steel, rubber, other materials. Centrifugal pump is mounted in tank having 32 gal. capacity. Belt surface speed is 4600 fpm.



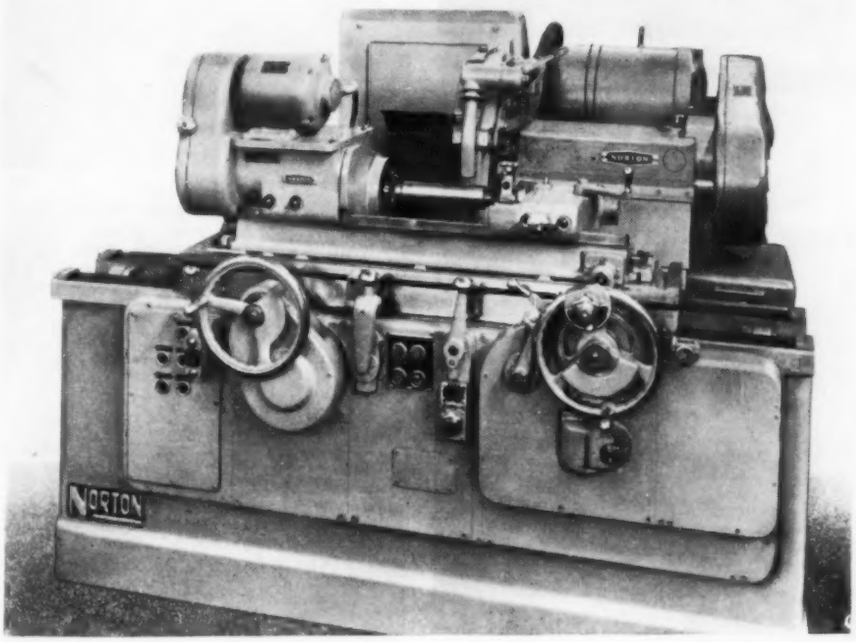
BELT SANDER—*Woods Engineering Co., Norwalk, Conn.* Model 40 belt sander and tool grinder handles wood, metals, plastics, glass and rubber, can also be used for deburring and finishing small parts. The platen work area is 5x8½ in. Standard belts are 4x36 in., and the ball-bearing pulleys are tested to 5000 rpm. The work platen is reversible.



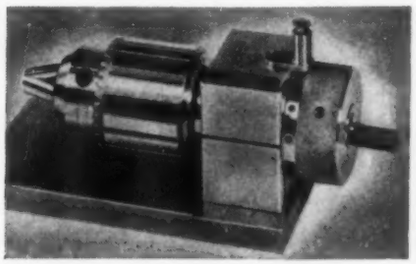
ATTACHMENT — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Cylindrical grinding and indexing attachment No. 616 is used on surface grinders for dry grinding of small cylindrical work and work requiring indexing. The centers swing 6-in. dia. and take work 5¼ in. long. Maximum grinding angle is 45°.

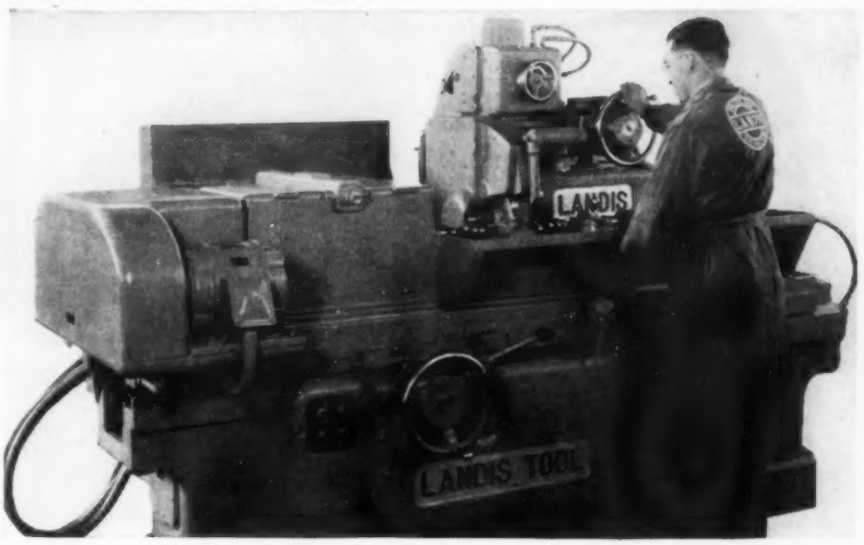


CYLINDRICAL GRINDER — *Arter Grinding Machine Co., Worcester 5, Mass.* No. 135 automatic cylindrical grinder grinds, by the straight-in or plunge-cut feed method, straight or tapered diameters on work which can be held in centering devices. It feeds work by indexing turret. Work to 18 in. between centers and 5-in. dia. can be handled. Max. length of grind is 5 in.



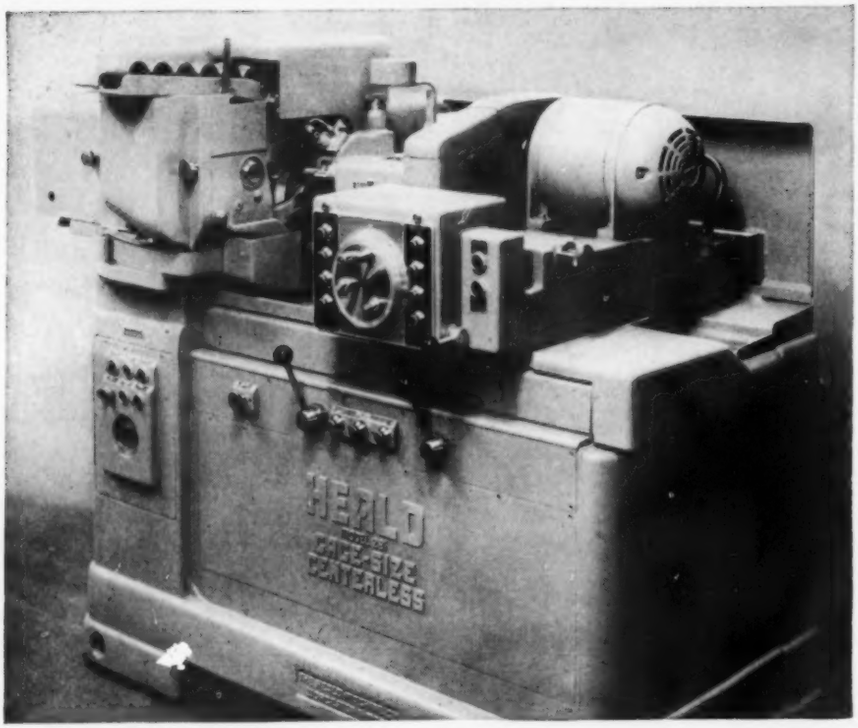
CYLINDRICAL GRINDERS—*Norton Co., Worcester 6, Mass.* The 6- and 10-in. type CTU cylindrical grinders are designed for operating convenience and accuracy. The 6-in. CTU is in two lengths which take 18 and 30 in. between centers. Plain hydraulic and semi-automatic arrangements are available in either length. The 10-in. CTU is available in six lengths taking 18, 36, 48, 72, 96 and 120 in. between centers. All sizes are available as plain hydraulic. ←



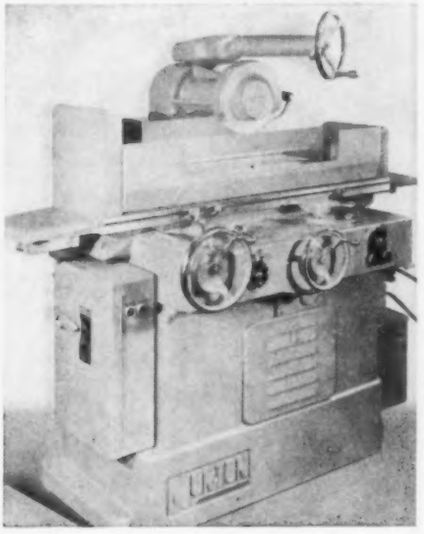


GRINDING ATTACHMENT — *Star Gauge Co.; distributed by Gale Forssen Co., 64 Monmouth St., Springfield 9, Mass.* Sta-Ga-Co rotary grinding attachment, when attached to magnetic chuck of surface grinder, will grind such work as bushings, punches, radii, round and longitudinal slots, and flats. Chuck capacity is 0 to ½ in., and the spindle has a 7/16-in. hole straight through.

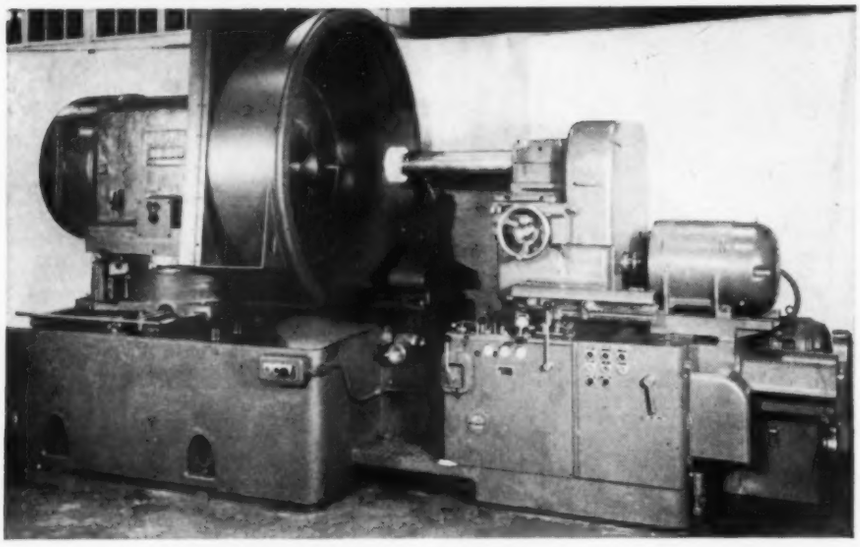
CONTOUR GRINDER—*Landis Tool Co., Waynesboro, Pa.* Type DH, 5x40 in., is for production grinding of camshafts. Work rotation automatically slows for finishing more accurate contour. Mechanical timing mechanism is used. ←



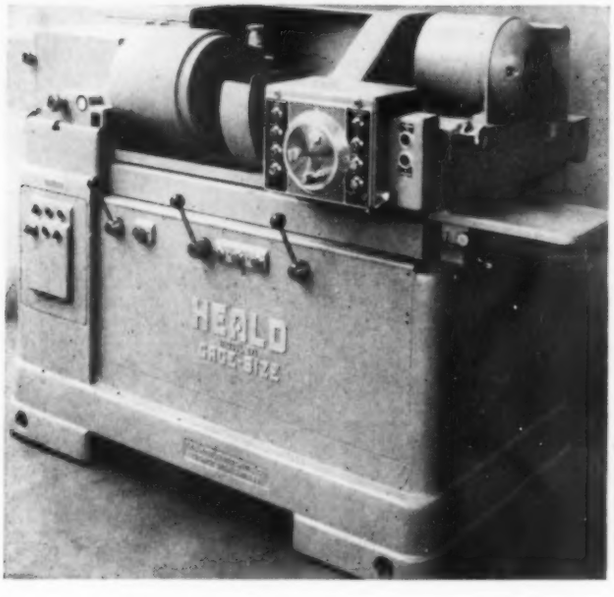
INTERNAL GRINDERS—*The Heald Machine Co., Worcester 6, Mass.* Models 281 and 381 centerless internal-grinding machines are for mass-production grinding of parts that can be rotated on their outside diameters while grinding the bore. Furnished in both Gage-Matic or Size-Matic models or in combination. Model 281 can handle work with max. O.D. of 4½ in. and grinds holes 3 in. long. Model 381 can handle 9-in. O.D. work and grind holes 6 in. long. ←



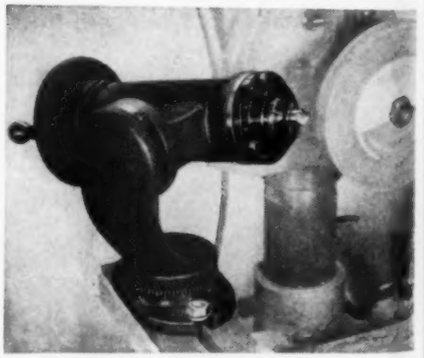
LIGHT SURFACE GRINDER—*Norton Co., Worcester 6, Mass.* Light hydraulic surface grinder, 8x24 in., is arranged with horizontal spindle, hydraulic and hand table traverse, and automatic hydraulic crossfeed. Both table traverse and cross-feed handwheels automatically disengage during hydraulic operation.



INTERNAL GRINDER — *Bryant Chucking Grinder Co., Springfield, Vt.* No. 150 internal grinder is a large machine for precision work. New features include fingertip control through hydraulic pressure, 60-in. faceplate, and workhead which swings for angular work. ←

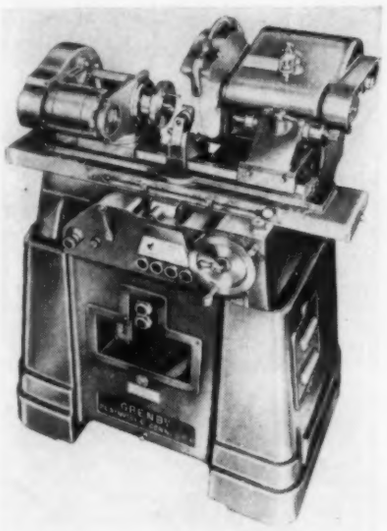


← INTERNAL GRINDERS — *The Heald Machine Co., Worcester 6, Mass.* Models 271 and 371 chuck-type internal-grinding machines are exactly alike except for size. Model 271 has a 15-in. swing over the table, 5-in. maximum length of hole and 5-in. maximum dia. of hole. Model 371 has 16½-in. swing, 10-in. maximum length of hole and 6-in. maximum dia. of hole. The grinding machines can be furnished in Gage-Matic, Size-Matic combination models.

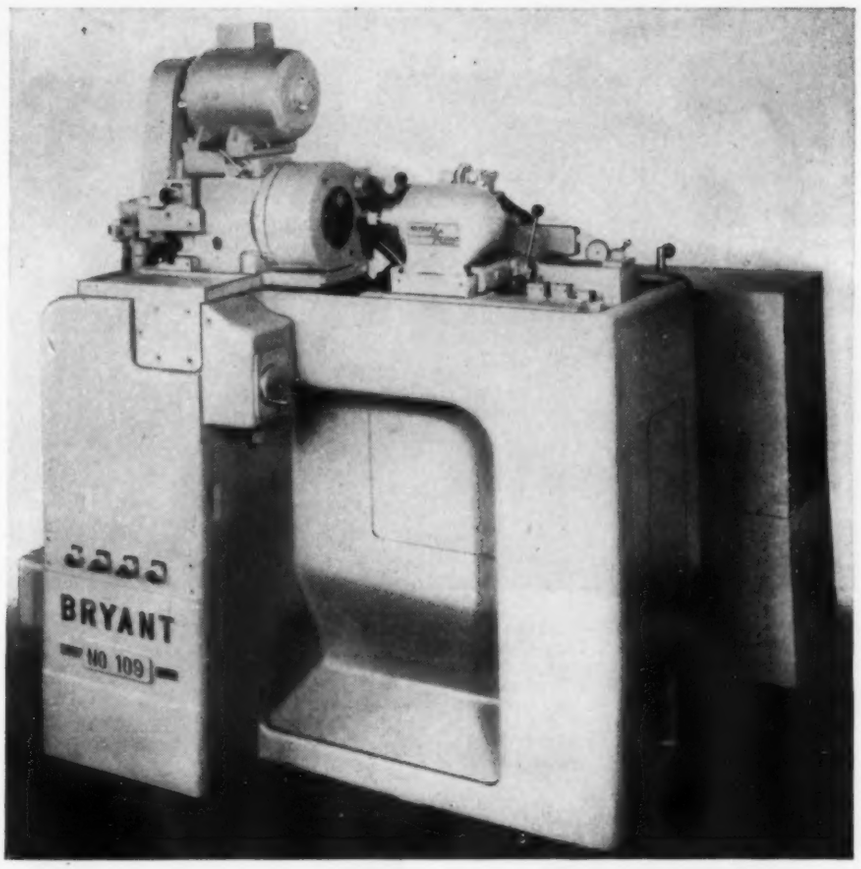


RELIEF GRINDER—*Machine Products Co., 1640 S. Hobart Blvd., Los Angeles 6, Cal.* Model 100-B, an I-G-C relief grinder is designed to handle countersinks, center drills, integral pilot cutters and pilot drills, right or left hand. It can be used in small tool-cutter grinding. It fits any standard grinder and handles work from 1/16- to 1-in. dia. with standard collets.

TOOLROOM GRINDER — *Rwett Lathe & Grinder, Inc., Brighton 35, Mass.* Precision grinder is for toolroom and small-lot production grinding, Model 1024. Two internal spindles for small and large holes and one external spindle with 10-in. wheel are interchangeable. Capacity: holes from ¼- to 9-in. dia. to 6-in. depth, and cylindrical grinding to 10-in. dia. and 18-in. length.

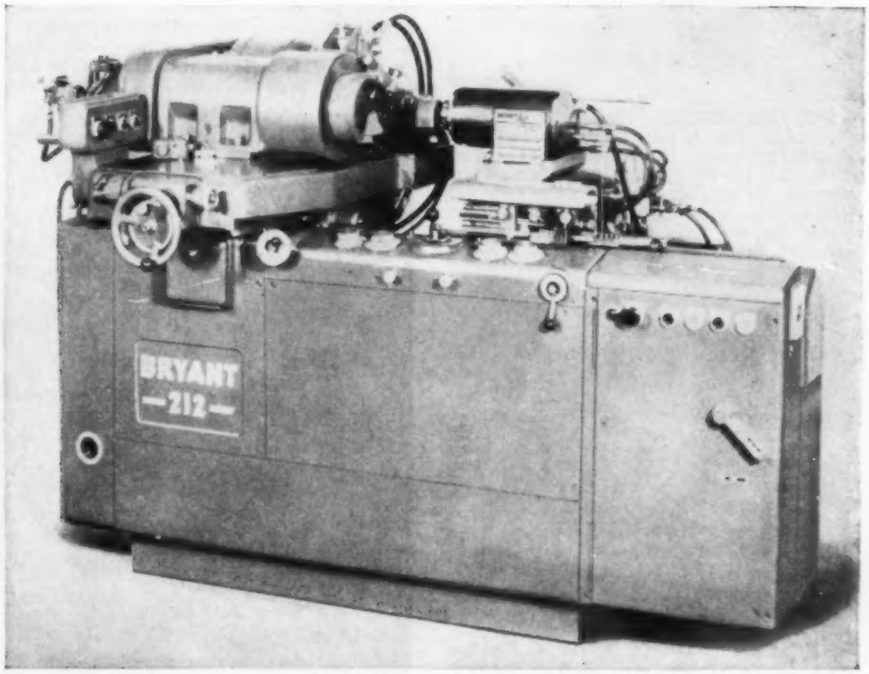


HYDRAULIC GRINDERS — *Grenby Mfg. Co., Plainville, Conn.* The EG-103 universal external hydraulic grinder, has a recommended capacity for work of 3-in. dia. times 10 in. long between centers. The IG-103 universal internal hydraulic grinder, has a capacity for internal work of 3-in. dia. times 4-in. long. Either machine can be equipped with two heads to make a combination internal-external grinder.

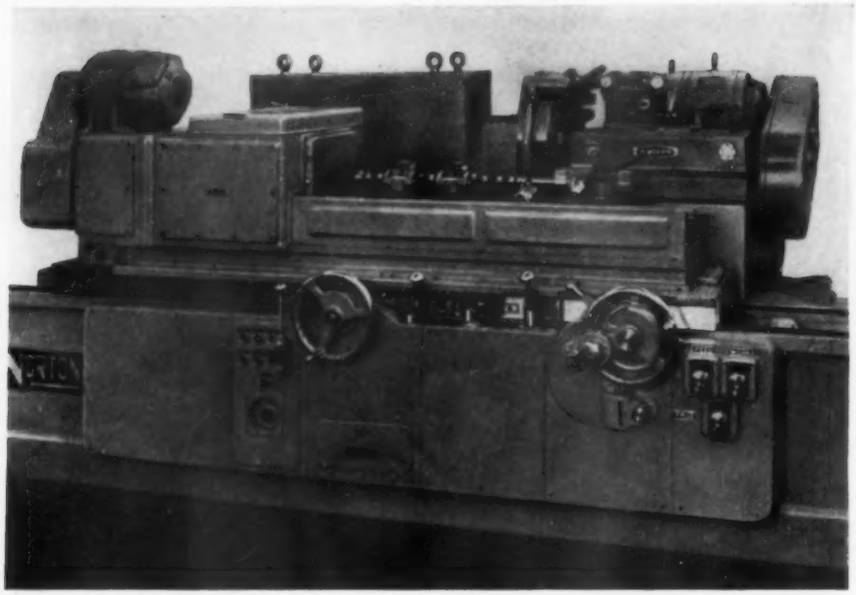


INTERNAL GRINDER — *Bryant Chucking Grinder Co., Springfield, Vt.* The No. 109 automatic internal grinder is for high-production grinding of bores from ¼- to 3-in. dia. and to 4 in. deep. Work up to 9-in. dia. can be handled. It has a hydraulic and electronic control arrangement that provides completely selective, infinitely variable cycles. The operator need only load and unload the work and trip the valve to start the cycle, through rough-grind, true wheel, finish-grind and return to chucking position.

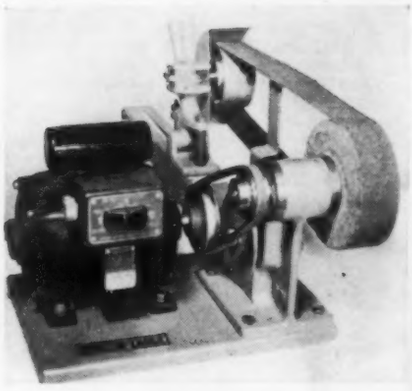
SURFACE GRINDER—*DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* The Handraulic surface grinder, Model GH-1, combines the features of fingertip control of conventional hand-operated grinder with power feed found in hydraulically powered machines. Speed of table travel can be varied from 5 to 50 fpm.



AUTOMATIC INTERNAL GRINDER —*Bryant Chucking Grinder Co., Springfield, Vt.* No. 212 has 9-in. swing inside the standard water guard and 12-in. wheelslide traverse. Work with bores from 5/16- to 3½-in. dia. can be ground. Grinding traverse permits 3-in. lengths. For small bores, Hi-Frequency wheel spindles operate to 100,000 rpm.

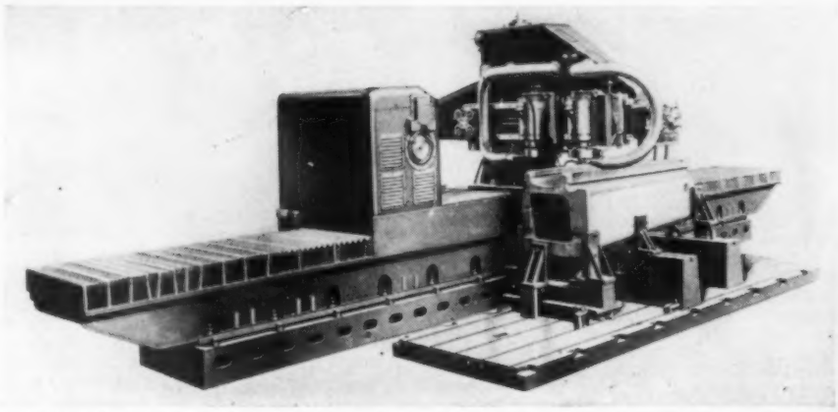


CAMSHAFT GRINDER—*Norton Co., Worcester 6, Mass.* No. 2 Cam-O-Matic is for production grinding of automotive camshafts. Three standard lengths are 26, 30 and 40 in. between centers.

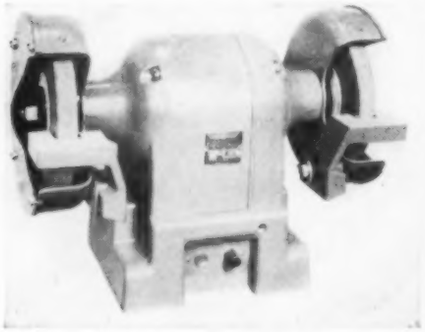


UTILITY GRINDER — *Porter-Cable Machine Co., Syracuse 8, N. Y.* An abrasive belt has been applied to a utility grinder. The belt operates over a resilient contact roll which is said to eliminate chatter. Grinder is adjustable 90° and is shown in horizontal position.

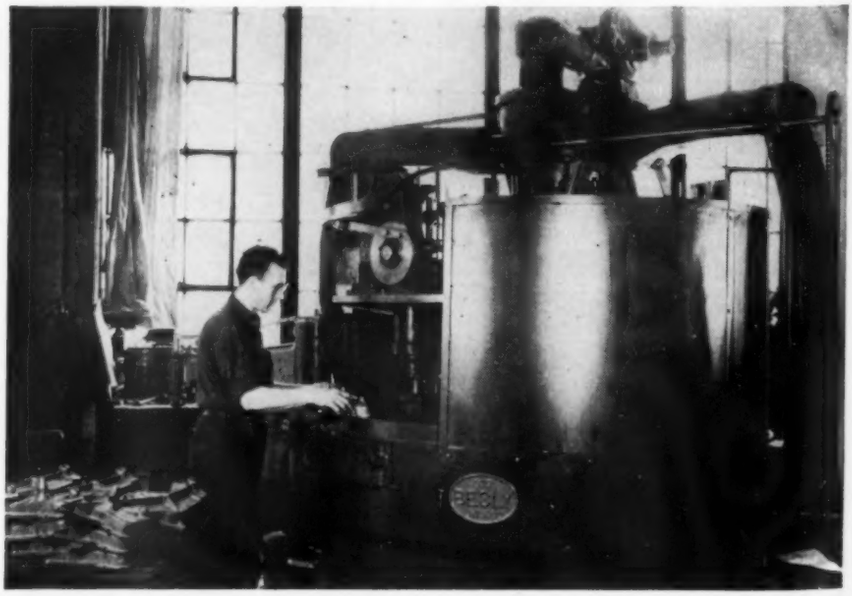
WET GRINDERS — *Hisey-Wolf Machine Co., Cincinnati 25, Ohio.* A line of wet grinders is made in sizes for 10, 12, 14, 18, 20, 24 and 30 in. grinding wheels. Machines are made single or double end, and in a model with one wheel for dry operation and the other for wet grinding.



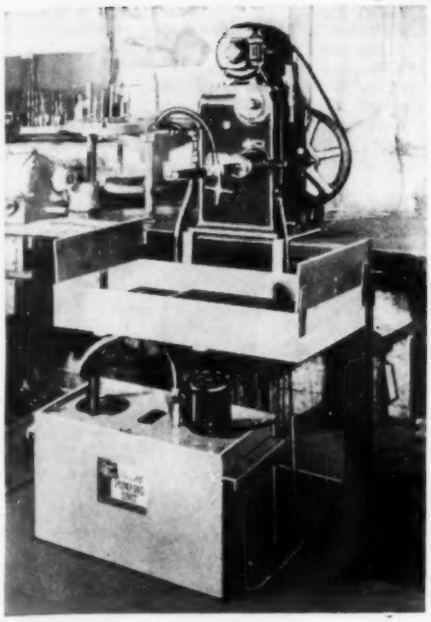
PRECISION WAY GRINDER—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Unit is said to develop surfaces of a flatness varying by only a few ten-thousandths of an inch over a length of 20 ft. or more. Designed to produce flat bearing and sliding surfaces which formerly depended on hand scraping. Grinding may be at any angle for V-ways, dovetail slides, vertical surfaces and flat ways.



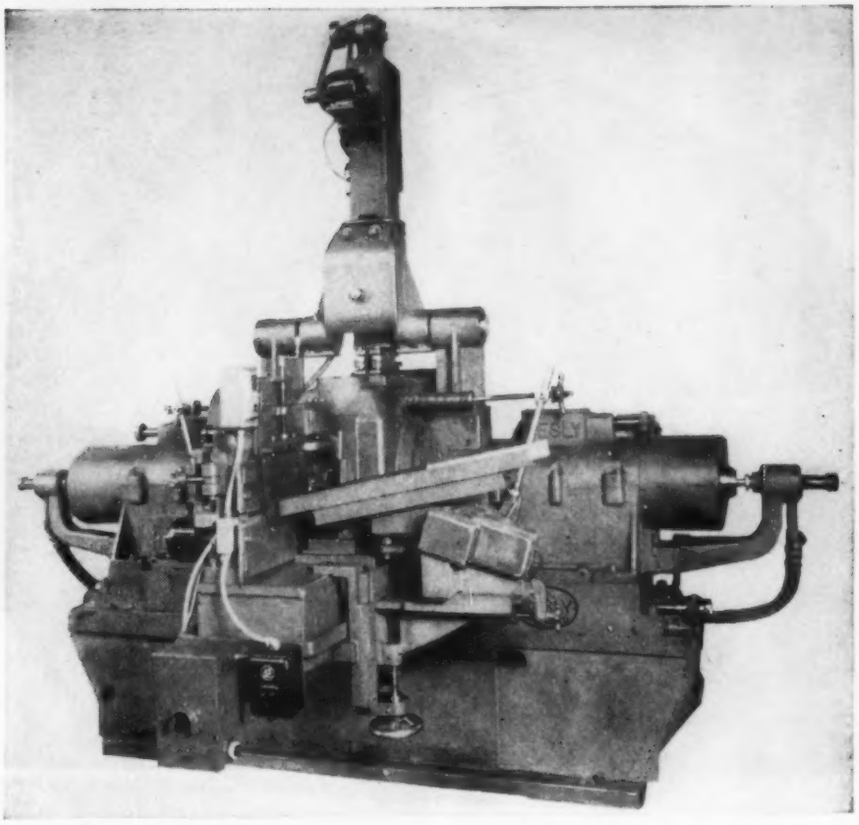
BENCH GRINDER—*Black & Decker Mfg. Co., Towson, Md.* A 6-in. heavy-duty bench grinder has a medium-grade wheel for rough fast work and a fine-grade wheel for finishing and tool sharpening. Guards permit a 3-section wire wheel brush without changing the setup.



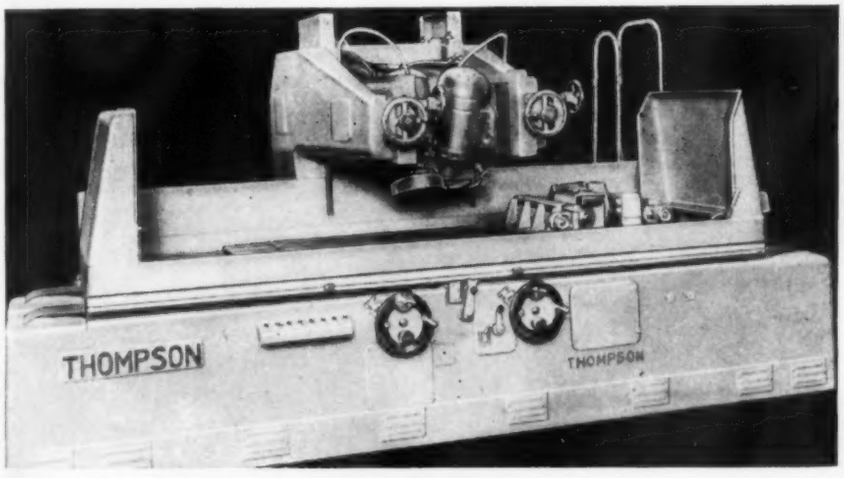
WET GRINDER—*Charles H. Besly & Co., 118-124 N. Clinton St., Chicago 6, Ill.* Vertical-spindle wet grinder with rotary feed, No. 372, grinds cast-iron gear covers at a rate of 250 pieces per hour. It has 52-in wheel. Operator places castings in fixture and removes ground pieces.



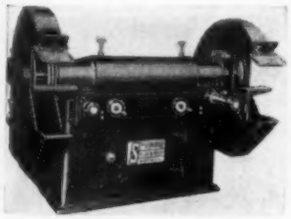
WET-CUTTING UNIT — *Gray-Mills Corp., Evanston, Ill.* Wet-cutting conversion unit for use on Sunnen bushing can be attached in 20 min. without cutting or drilling. Centrifugal pump, is mounted in 12-gal. baffle-equipped coolant tank. It pumps oil to work. Oil returns to pan which slides beneath mandrel.



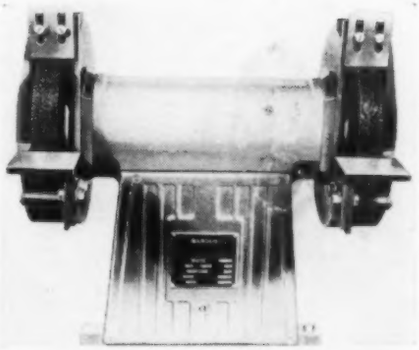
DOUBLE-SPINDLE WET GRINDER —*Charles H. Besly & Co., 118-124 N. Clinton St., Chicago 6, Ill.* No. 226 is equipped with electric vibrator trough feeder with chain and lug pick-off for feeding double-end wrenches. Grinds 2400 8-in. wrenches per hour on four surfaces.



DOVETAIL - WAY GRINDER — *Thompson Grinder Co., Springfield, Ohio.* Unit is designed to eliminate tedious and expensive hand scraping on machine-tool dovetail ways. The illustrated model has capacity for 12x48-in. long, male or female, dovetail slides with size control from electric diamond dressing devices.

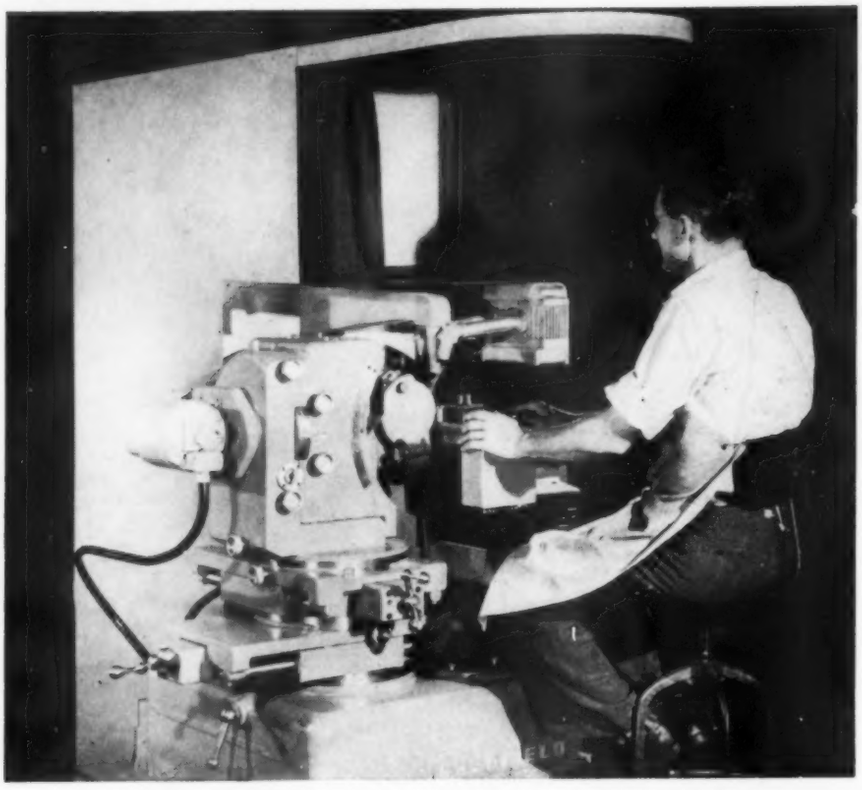


GRINDER—*Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* No. 35 Twin-Motor variable-speed snagging grinder carries two 24x3x12-in. grinding wheels.

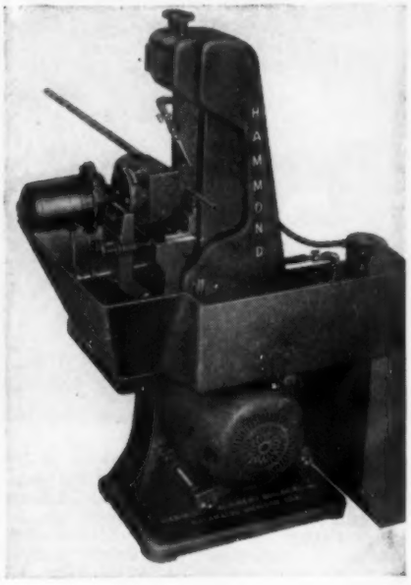


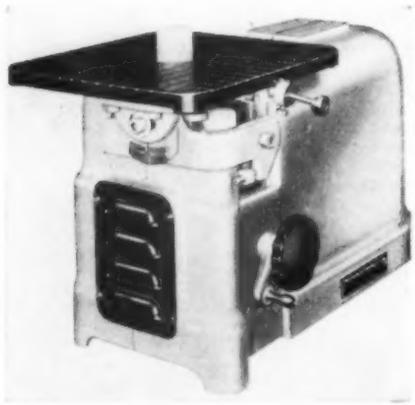
BENCH GRINDER—*Bardco Mfg. and Sales Co., 2450 E. 23rd St., Los Angeles, Cal.* Grinder has special small-diameter motor. Absence of projection in working area between wheels permits unobstructed motion of work. Entire grit portion of wheels may be utilized.

GRINDER—*Charles H. Besly and Co., Chicago 6, Ill.* Vertical-spindle full-hydraulic grinder grinds faces of shears, wood chisels, scissors and cutlery. One operator with two machines is said to be able to grind 600 surfaces per hr.



CRANKSHAFT REGRINDERS — *Landis Tool Co., Waynesboro, Pa.* Two crankshaft regrinders have been added to the present line of five sizes. The 18x30-in. size will handle Ford, Studebaker Champion and Willys crankshafts. The 18x42-in. size will handle Chevrolet, Plymouth and other 6-cylinder passenger car and light truck crankshafts.

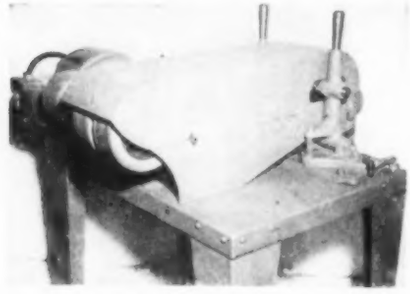




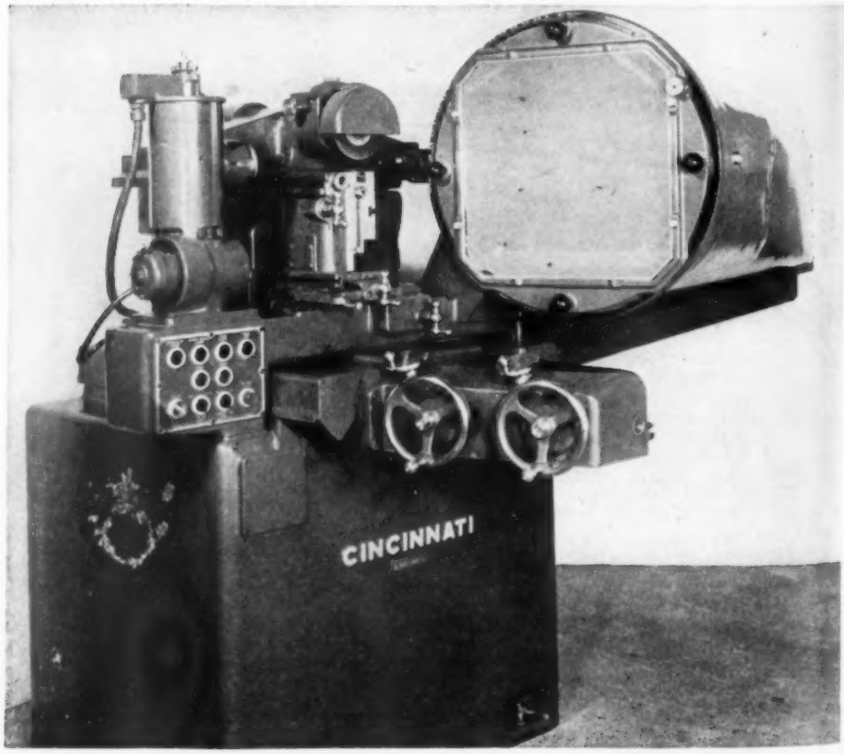
PROFILE GRINDER — *Milwaukee Chaplet & Mfg. Co., 1023 S. 40th St., Milwaukee, Wis.* Bench-type high-speed profile grinder has work-table which can be tilted 15° in any direction. Table also has 3¼-in. vertical adjustment by means of a crank. The motor drives spindle at 20,000 rpm. The spindle reciprocates ⅛ in. vertically 100 times per min.

GRINDER—*The Sheffield Corp., Dayton 1, Ohio.* Projectoform grinder incorporates optical system which uses either contour or opaque projection with surface illumination and 25:1 or 50:1 optical magnification. Image is in natural position. Operator can sit before projection screen while operating micrometer wheels.

GRINDER-POLISHER — *Hammond Machinery Builders, Inc., Kalamazoo, Mich.* OD-1 cylindrical grinder-polisher for rods, bars and tubes from ⅛- to 1¼-in. dia. can be operated wet or dry. Work supports handle ½-in. bars up to 18 ft. long, and 1-in. bars up to 8 ft. long. Feed rate can be varied from 0 to 18 fpm.



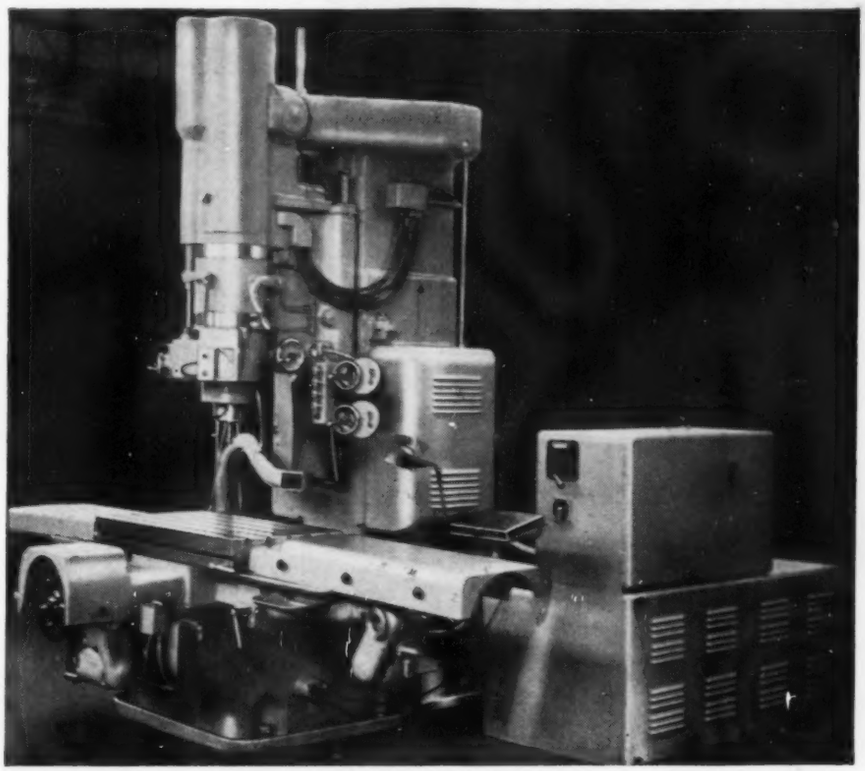
BENCH GRINDER—*Porter-Cable Machine Co., Syracuse 8, N. Y.* Model DBS double-belt bench grinder has two 7-in. dia. x 2½ in. wide resilient contact rolls located side by side. 1-hp. motor cutting speed is 5200 sfpm.

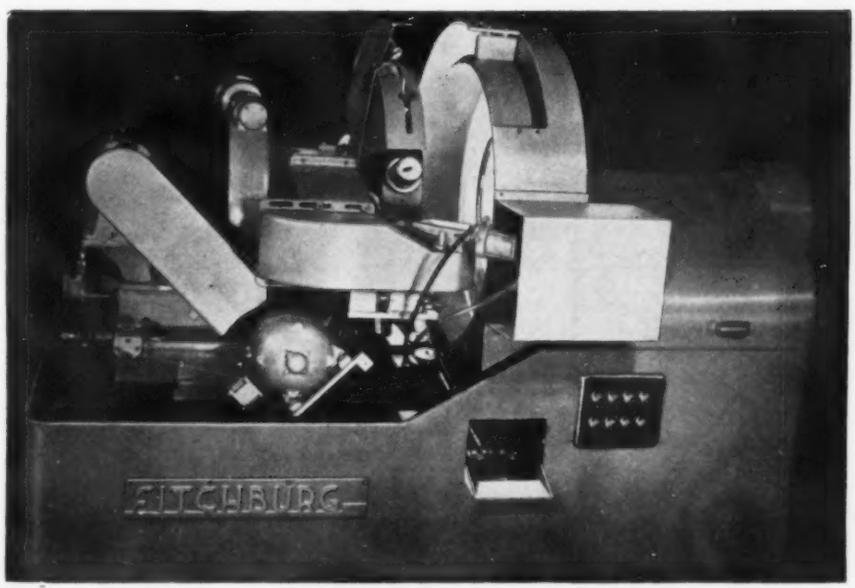


GRINDING MACHINE—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Projecto-Form grinding machine for accurate grinding of small profile shapes provides an optically enlarged image of work which can be compared with a previously prepared, enlarged master scale drawing. Standard magnification is 20:1; a 40:1 ratio is available.

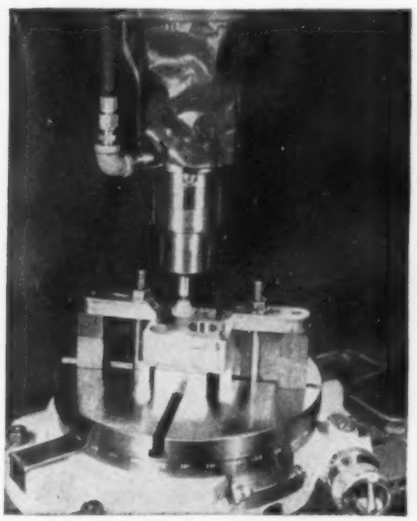
RADIUS GRINDING—*Hill Machine Co., 1032 Mulberry St., Rockford, Ill.* Model B grinding fixture grinds radius side-milling cutters to a true radius up to 180° of arc. It takes cutters to 6-in. dia. and is mounted on standard grinder.

GRINDER—*Fitchburg Grinding Machine Corp., Falulah Rd., Fitchburg, Mass.* Consta-Contac grinding, where three or more parts are in constant contact with a single grinding wheel, is used on a machine which is said to grind automotive engine-valve seats at the rate of 2,160 per hr. Loading and unloading are automatic.

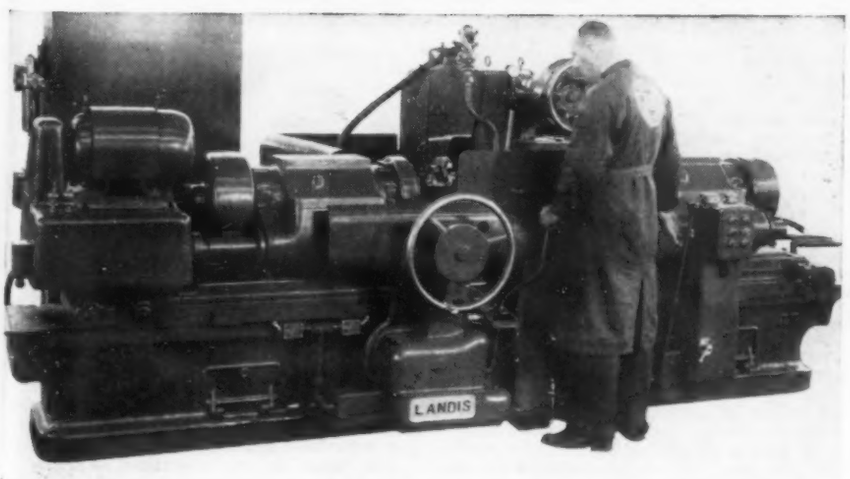




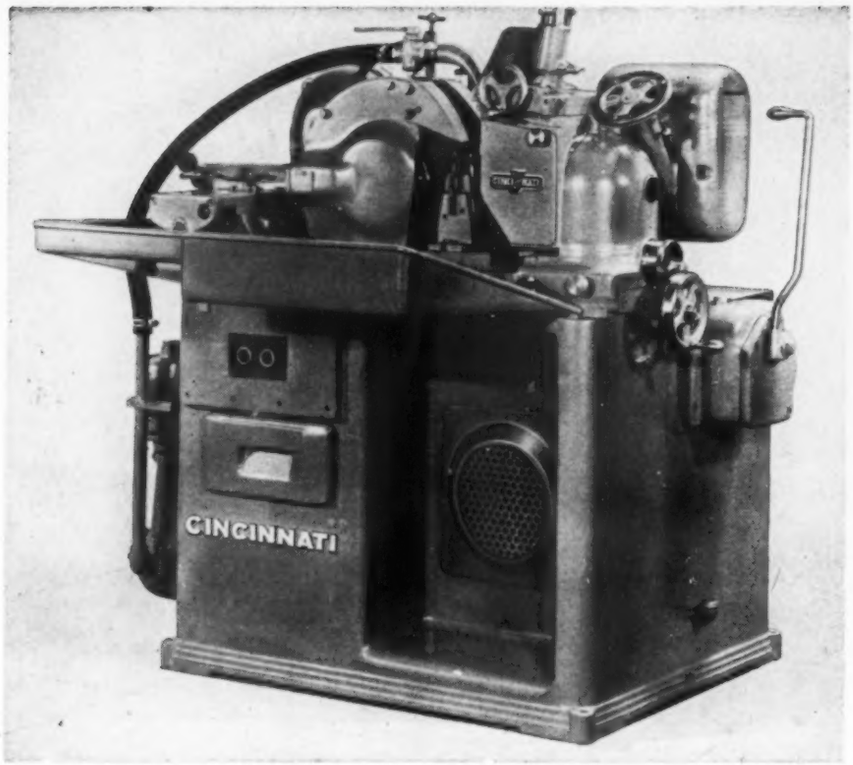
JIG GRINDER—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford, Conn.* A jig grinder, No. 2C, is said to be the equal of a jig borer for locating and spacing precision, plus the ability to rapidly remove stock and finish-grind to precision limits. It has a table surface 22x44 in. with 36-in. longitudinal travel and 18-in. transverse travel.



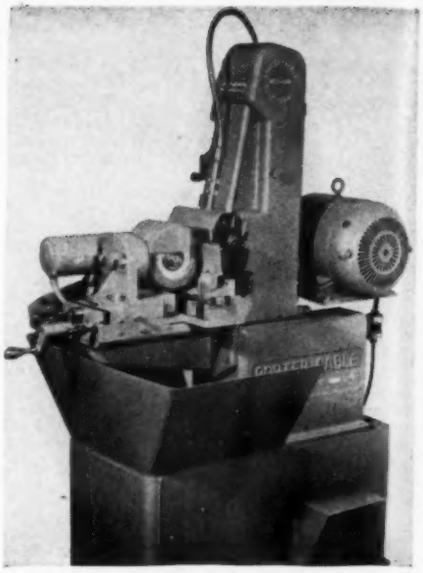
JIG GRINDING—*Vulcan Tool Co., 730 Lorain Ave., Dayton 10, Ohio.* A high-speed, air-driven attachment, the Vulcannaire, will convert jig borers and other machine tools to precision jig grinders. Speed can be controlled from 30,000 to 75,000 rpm. Holes from 1/16- to 1½-in. dia. can be ground.



CRANKPIN GRINDER—*Landis Tool Co., Waynesboro, Pa.* Type DH, 16x42 in., is supplied for crankshafts 32, 42, and 72 in. in length. Grinding-wheel feed is hydraulic with hand feed to compensate for wheel wear.

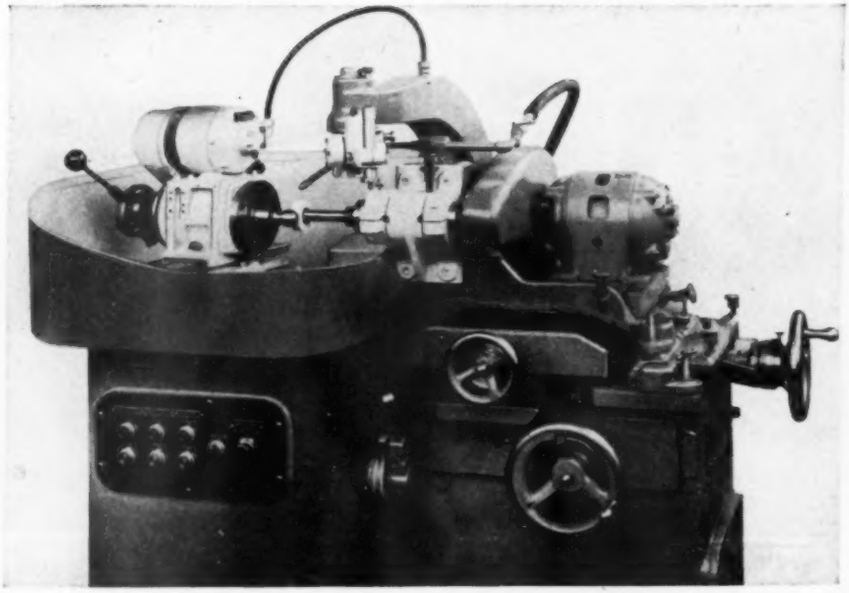


CENTERLESS GRINDER — *Cincinnati Grinders Inc., Marburg, Ave., Cincinnati 9, Ohio.* Filmatic centerless-grinding machine, No. 0, is for small precision-ground work. Capacity is 0- to ½-in. dia. 5-in. length for through-feed and 4-in. length for infeed work.



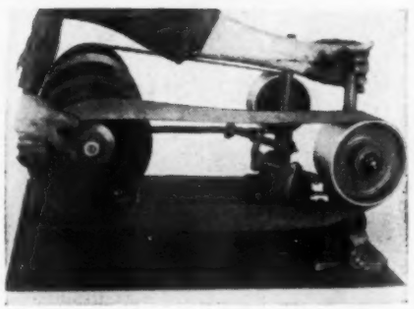
CENTERLESS GRINDER — *Porter-Cable Machine Co., Syracuse 8, N. Y.* Centerless wet-belt grinder handles work from ¾ in. to 2 ft. long (and longer if proper supports are used) and ranging from 3/32- to 2¼-in. dia. An endless abrasive belt operates over a contact roll that is resilient to follow work and eliminate chatter.

GRINDER—*Corlett-Turner Co., 1001 S. Kostner Ave., Chicago 24, Ill.* G3 off-hand or freehand grinder has individual arbor-mounted wheels and triple speed selection. Speeds suit any vitrified wheel from 1- to 4-in. dia. A ¼-in. capacity collet-type arbor is provided.

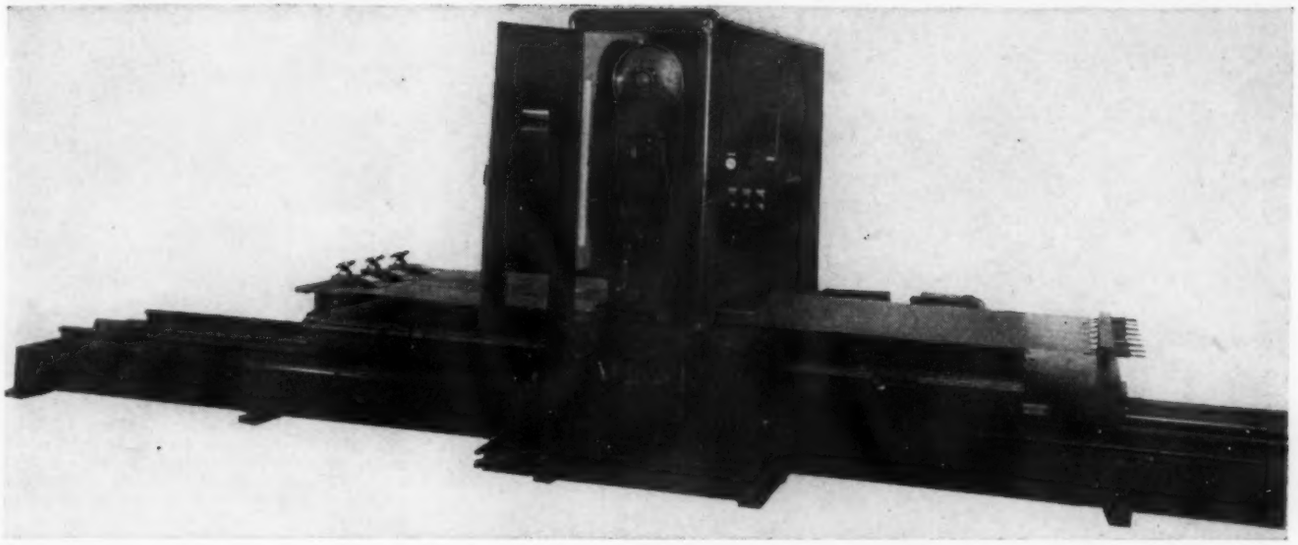


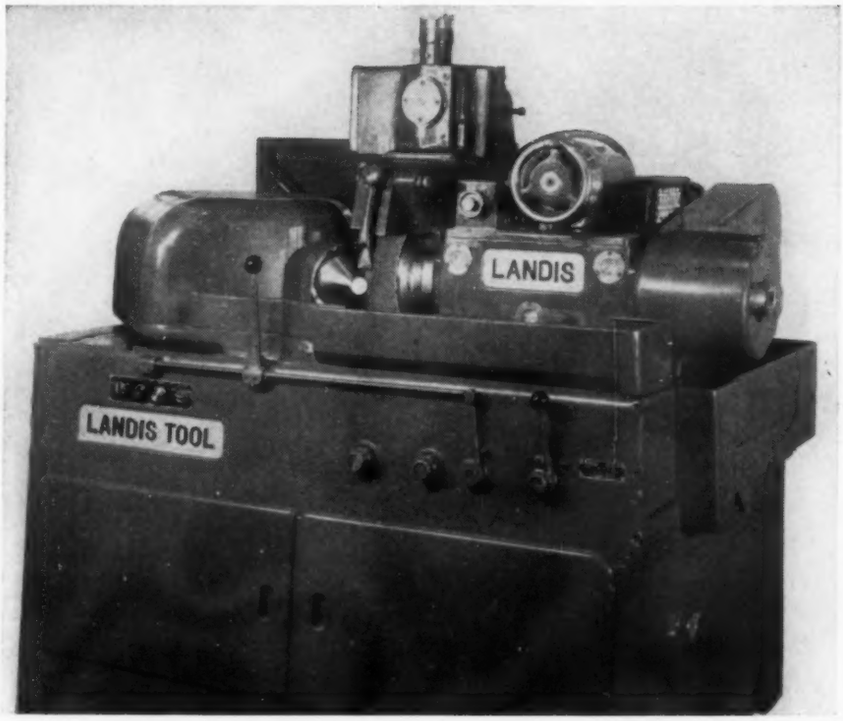
OSCILLATING GRINDER — *Gear Grinding Machine Co., Detroit 11, Mich.* Universal oscillating grinder will handle internal and external cylindrical surfaces, internal tapers and external conical surfaces, spherical, and angular surfaces. Combinations can be ground with one setup for blending straight to curved surfaces.

FINISHING MACHINE—*The Abrasive Machine Tool Co., East Providence 14, R. I.* AWF No. 5 Multi-Micro finishing machine is adapted for grinding of small-diameter bores in carbide dies. It uses diamond wheels and has a patented fast reciprocating device used in conjunction with normal reciprocation.



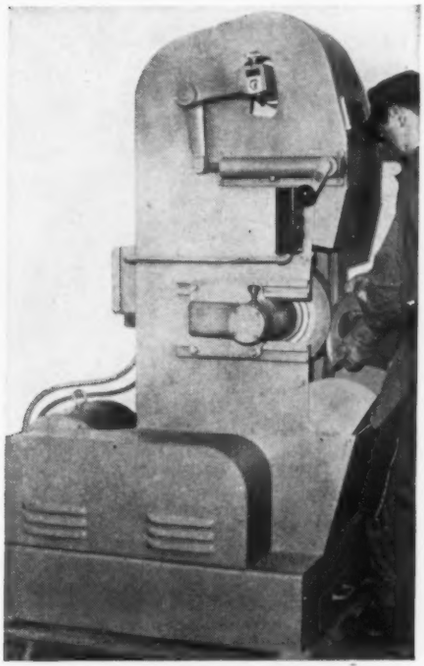
BENCH BACKSTAND — *Hammond Machinery Builders, Inc., Dept. GP-30, Kalamazoo 54, Mich.* No. 52, converts existing wheel bench grinders into production abrasive-belt units. Grinding wear is on abrasive belt rather than contact wheel.





VALVE GRINDER—*Landis Tool Co., Waynesboro, Pa.* The type H valve grinder handles automotive and airplane valves with face angles from 0 to 61½° and face dia. from 7/16 to 3½ in. Clamping is hydraulic. Loading and unloading may be done with the headstock spindle rotating, or the spindle may be cycled to stop when grinding is finished.

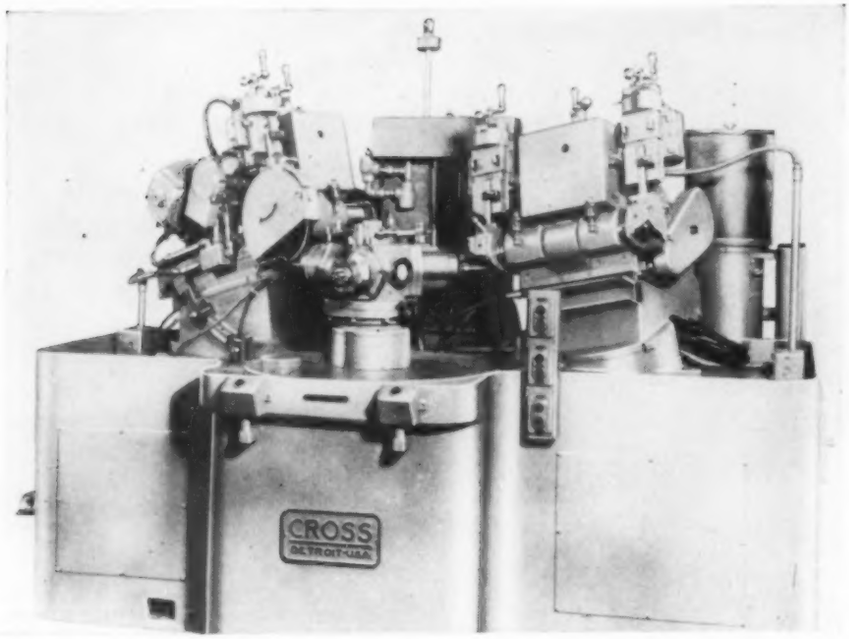
FLAT POLISHERS—*The Hill Acme Co., 6410 Breakwater Ave., N. W., Cleveland 2, Ohio.* A line of 2-roll vertical abrasive-belt grinding and polishing machines, available in three general types, performs flat polishing of ferrous and non-ferrous metals and other materials. Strip-type unit processes strip material in coiled form. The plate or bar type incorporates feed or pinch rolls for conveying material under the polishing head. The sheet type uses reciprocating hydraulic table drive. The machines are built in a progression of widths up to 60-in. Both the plate- and strip-type machines can be adapted to multi-stage processing by placing a group of them in series for continuous polishing.



CONTOUR SANDER — *Sand-O-Flex Corp., 4373 Melrose Ave., Los Angeles 27, Calif.* The Model 650C heavy-duty contour sander for finishing or sanding irregular surfaces or edges can be used on any rotating shaft. It has 12 brushbacked abrasive strips which can be fed out as needed from an internal cartridge. Over-all dia. is 10¾ in.

SURFACE - GRINDER — *Peterson Welding Laboratories, 1423 Virginia, Kansas City 6, Mo.* Grinder grinds flat-surface castings to within 0.001-in. accuracy without setup. A spider wheel permits operator to use both hands for work and use his feet to raise stone, 2 in. to grinding level. Model 1A has 14-in. stone, 3-hp. motor; 2A has 16-in. stone, 5-hp. motor.

BELT GRINDER—*Porter-Cable Machine Co., Syracuse 8, N. Y.* The C-6 belt grinder is designed for grinding and polishing of contours. A flexed abrasive belt on the unit approaches and leaves a formed contact roll at a slight angle. The pattern is turned into the contact roll, and the belt "drapes" itself into that pattern. The machine requires 26x38-in. floor space.

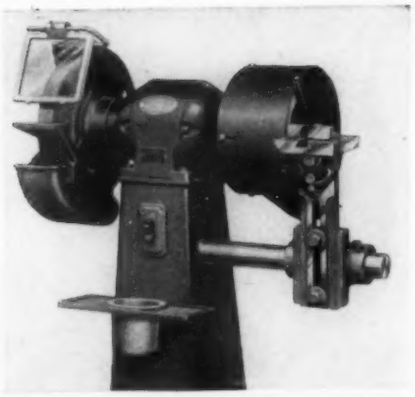


SPECIAL MACHINE—*The Cross Co., Detroit, Mich.* Machine grinds teeth in spring clutches from the solid, simultaneously chamfers one side. First of three stations is for loading and unloading. Teeth ground on second station and chamfered on third. Parts indexed by power turret. Up to 200 eight-tooth clutches produced per hr.

TOOL GRINDER—*Ex-Cell-O Corporation, 1200 Oakman Blvd., Detroit 6, Mich.* A special automatic tool grinder with two independent stations grinds straight faces of solid carbide, carbide-tipped, Stellite and high-speed steel tools. Following loading and clamping, automatic cycle takes tool to grinding wheel, grinds it for predetermined length of time, and returns it to loading position.

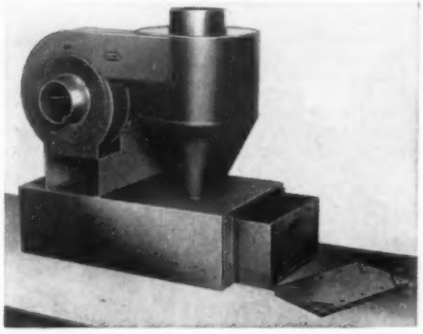
GRINDER—*Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* Single-end snagging grinder with interlocking speed control to prevent over-speeding of wheel, is available either for right- or left-hand operation, for vitrified- or resinoid-bond wheels, in sizes for 10- to 30-in. wheels. →

SURFACE GRINDER—*Reid Brothers Co., Inc., Beverly, Mass.* The Model 48 hand-feed surface grinder takes work 4x8x9 ⅛ in. high from the worktable. The ¾-hp. motorized spindle has 3450-rpm. speed. The elevating handwheel is graduated 0.0005 in., and the cross-feed handwheel is graduated to 0.001 in.

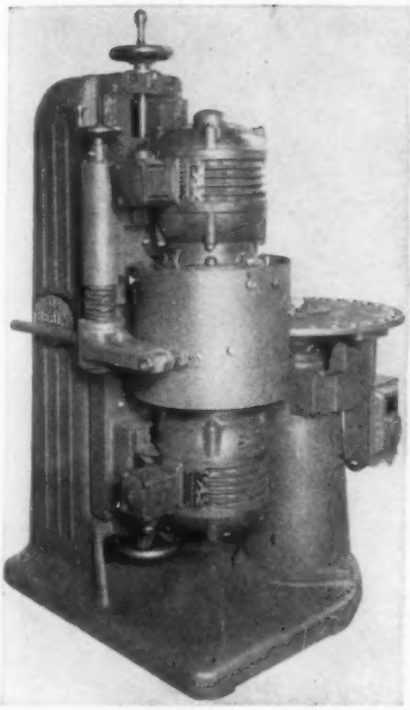


TOOL GRINDER—*Bradford Machine Tool Co., Cincinnati 4, Ohio.* Model 260 grinds carbide tools, is equipped with grinder for rough work on left and mounts cup wheel on right for finish grinding. Worktable adjusts to desired angle, and height.

FORM GRINDER—*Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Irregular forms on small round parts are ground to close tolerances on this small O.D. form grinder. Grinding wheel is shaped to desired form by universal cam-type dresser mounted behind wheel.

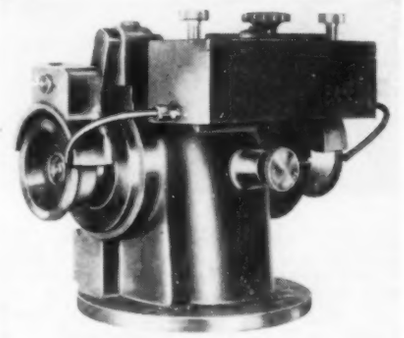


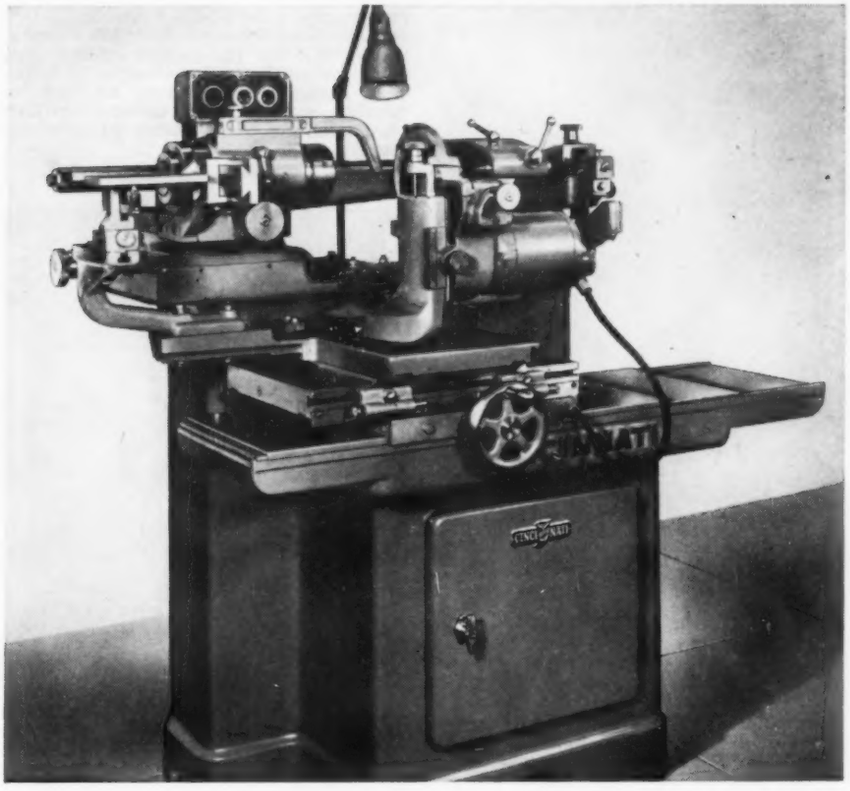
FILTERLESS DUSTKOP UNIT—*Aget-Detroit Co., Main & Washington Sts., Ann Arbor, Mich.* The Model 11N50 Dustkop collects dust, lint and dirt from heavy-duty polishing, grinding and buffing work. It has a stack-connecting sleeve so that piping can be installed to carry the cleaned air out-of-doors, eliminating customary second-stage filtering.



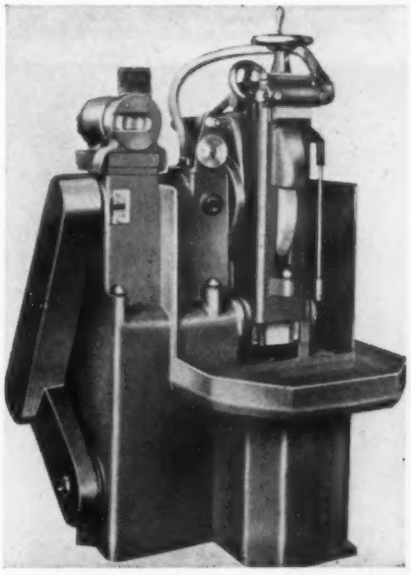
DRY GRINDER—*Charles H. Besly & Co., 118-124 N. Clinton St., Chicago 6, Ill.* Double vertical-spindle dry grinder No. 902 has rotary feed. Operator drops small parts onto horizontal rotary feed.

CARBIDE-TOOL GRINDER—*Hammond Machinery Builders, Inc., Kalamazoo 54, Mich.* Model 7 carbide-tool grinder is available in bench and floor models. It takes either 6- or 7-in. wheels, diamond cup or silicon-carbide cup.





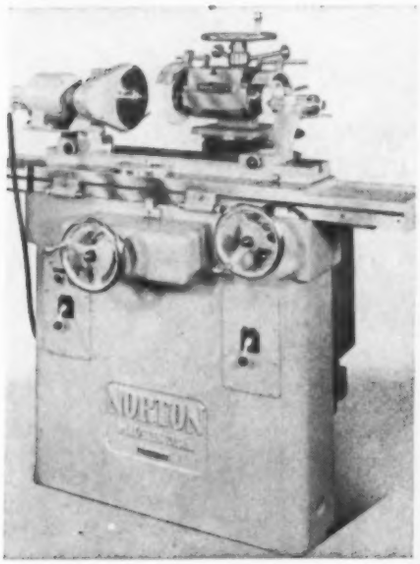
CONTOUR-CUTTER SHARPENER—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Machine sharpens contour-ground form-milling cutters. Cutters are sharpened by grinding on the periphery rather than on the flat rake face of the tooth. Teeth are ground by duplicating a master templet, and tracing is hand controlled.



TOOL GRINDERS—*Oliver Instrument Co., Adrian, Mich.* Two precision grinders are for single-point-tool sharpening. The machine with a 20-in. wheel and a 2-in. face is illustrated. Smaller machine has a 10-in. cup wheel with a 1½-in. face in which grinding is done on the face of the cup.

CUTTER, TOOL GRINDERS—*Covel Mfg. Co., Benton Harbor, Mich.* New spindle assemblies, designed especially for use with diamond wheels in grinding carbide cutters, have been developed for Nos. 12 and 22 cutter and tool grinders. Coarse and fine wheels are mounted at the two ends of spindle and head swivels 180° to place either ← wheel in working position.

LOADING DEVICE—*Landis Tool Co., Waynesboro, Pa.* Vibration-type loading device is for aligning screw blanks or similar parts for centerless grinding. Blanks move up a circular, inclined ramp on the inside face of the hopper wall, until they enter the feed tube at top. Movement is obtained through directional vibrations, utilizing one-half of the sine wave of alternating current through rectification.



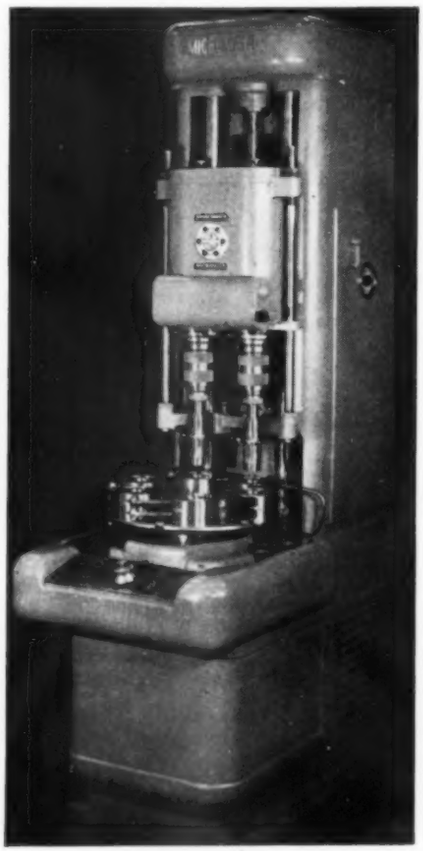
CUTTER, TOOL GRINDER—*Norton Co., Worcester 6, Mass.* No. 20 cutter and tool grinder has wheelhead which can be tilted to 15° each side of horizontal, and can be swiveled through 360°. Form-tool angles are ground without multiple setup and without changing wheel from one end of spindle to other.

TOOL GRINDER — *Norton Co., Worcester 6, Mass.* No. 2 Bura-Way tool grinder is for grinding convex single-point tools. Toolbit holder accommodates shanks to 2-in. square and is universal type. Tool can be fed to wheel in increments of thousandths.

MICROSIZE CONTROL—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* The Microsize electronic automatic-sizing control consists of three parts: gage ring, Micromold tool in which abrasive sticks are molded into plastic holders, and electrical control circuit. When a bore is honed to size, device takes control of the Microhoning machine and directs it through proper sequence of operations to end the cycle. It is said that bore-to-bore size can be held to 0.0003 in. or less in production.

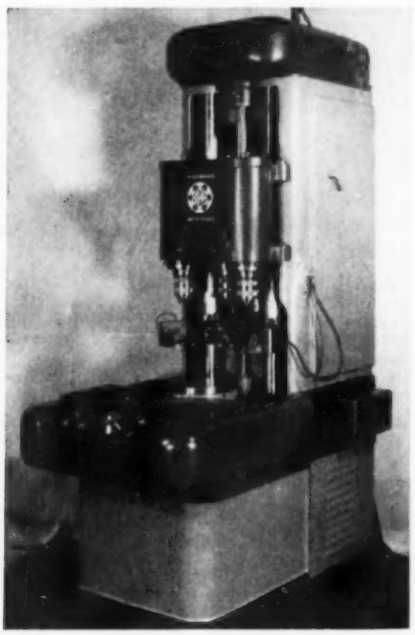
DUST COLLECTOR—*Torit Mfg. Co., Walnut & Exchange Sts., St. Paul 2, Minn.* The No. 122 self-contained dust collector is 9 ft. 7 in. high, 62¼ in. wide and 26 in. deep. Suction is through a 7-in. inlet, developing 1500 cfm. with an air velocity of approximately 6000 fpm.

DUST COLLECTOR — *Aget-Detroit Co., Main at Washington St., Ann Arbor, Mich.* Dustkop Model 420, a backstand attachment, changes a pedestal grinder to a dustless backstand sander-grinder combination. It is self-contained.

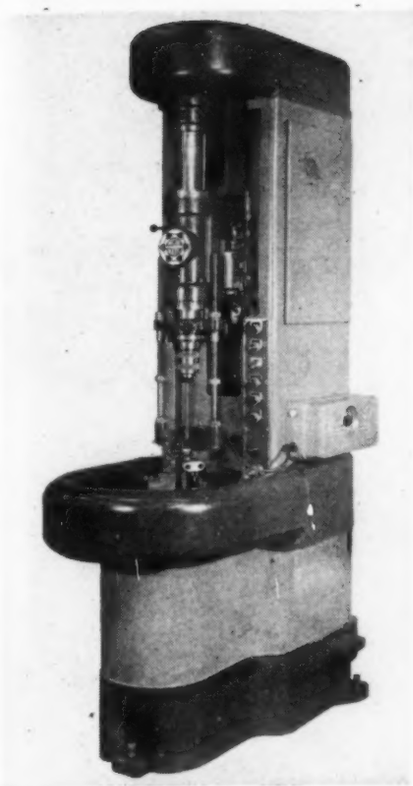


HONER—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Double-spindle, automatic machine No. 710 microhones two connecting rods simultaneously. Maintains bore size to variation of 0.0003 in. or less.

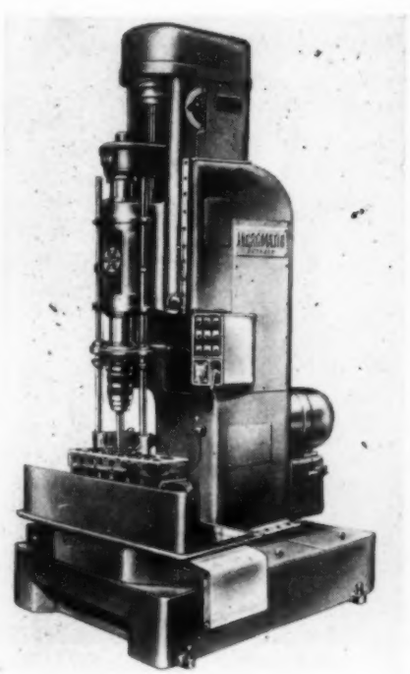
HONER—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Vertical quill-type single-spindle machine No. 722 is adapted for Microhoning bores up to a diameter of 2 in.



HONER—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Three-spindle microhoning machine, No. 705-3, for bore sizes from ¼ to 1 in. The three spindles rough, semi-finish, and finish progressively.

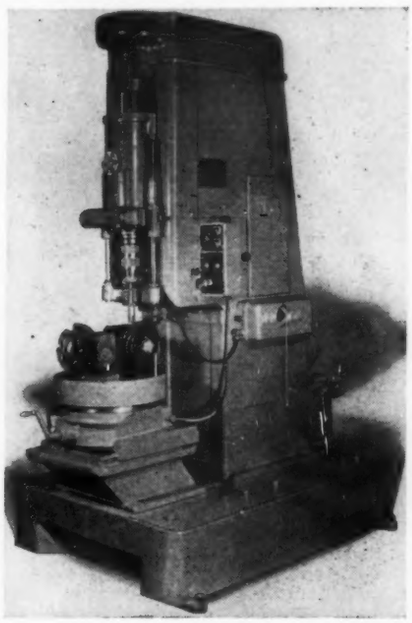


VERTICAL HONING MACHINE — *Micromatic Hone Corporation, 8100 Schoolcraft Ave., Detroit 4, Mich.* No. 721 has quill-type construction. It is completely automatic, including: microsizing; automatic rotary-indexing table; and automatic tool expansion, collapse, and compensation for wear.

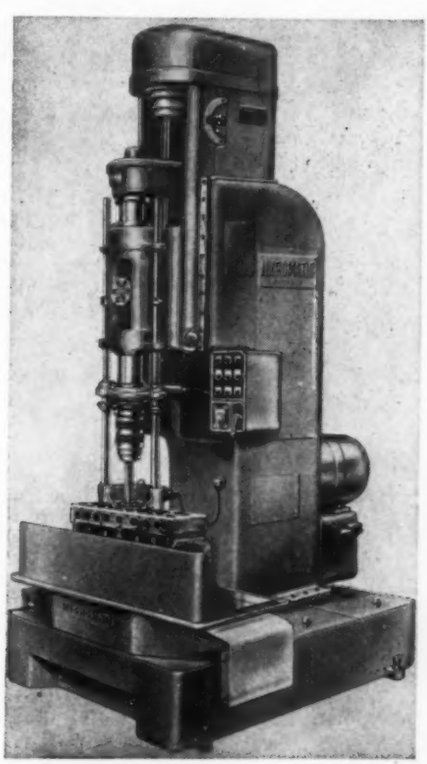


QUILL-TYPE HONING MACHINE—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* No. 728, tooled and fixtured to microhone a 4-cylinder block with a 2½-in. bore, is automatic with lateral indexing table.

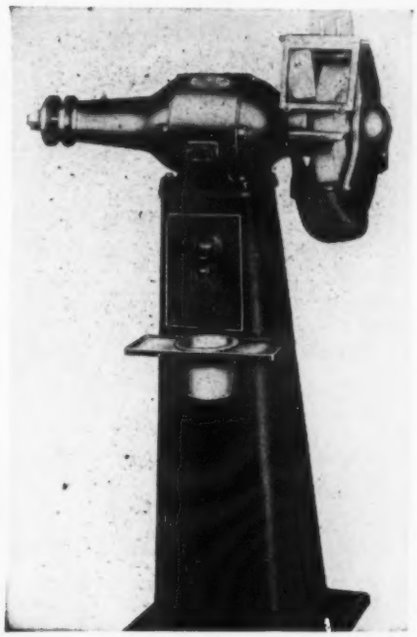
MECHANICAL MICROHONER—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* No. 717 is designed for inside diameters from ½ to 4 in. and up to 7-in. length. The machine has 6 rotation speeds and 4 reciprocation speeds.



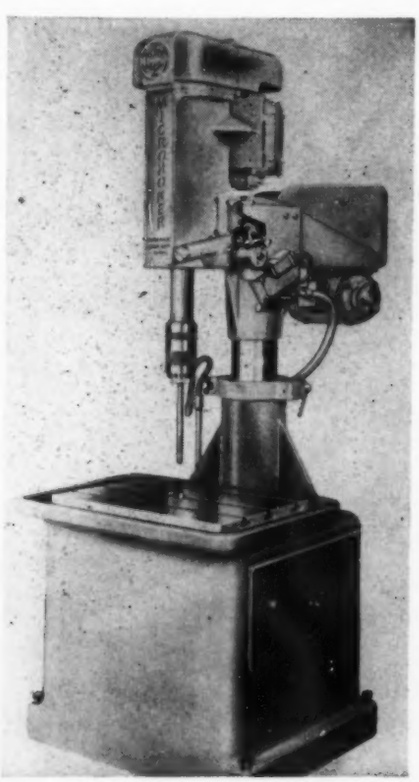
HONER—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Standard vertical honing machine, No. 713, is designed to Microhone bores from 1 to 2 in.



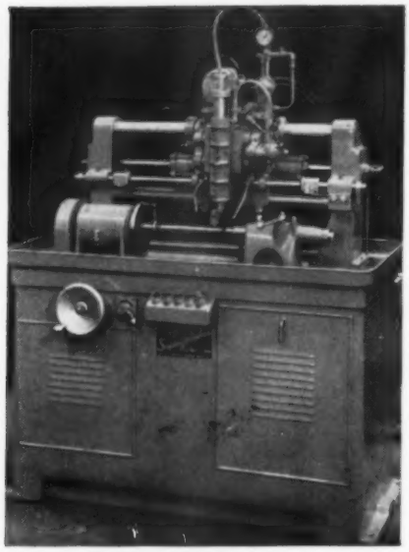
MICROHONING UNIT — *Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* A heavy-duty honing machine, it has a single quill-type spindle and will hone bores from 1- to 4-in. dia. up to 9½ in. long. A unit-type design is incorporated to increase the adaptability of the machine.



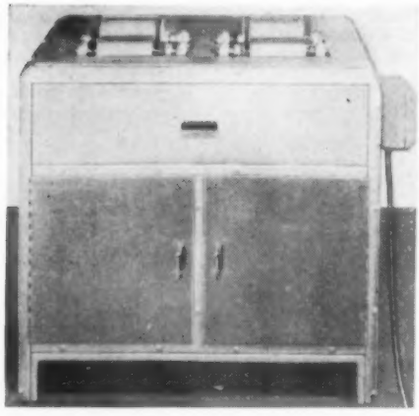
GRINDERS, BUFFERS — *Bradford Machine Tool Co., 657 Evans St., Cincinnati 4, Ohio.* Line of Metalmaster bench- and pedestal-type grinders and buffer-polishers known as the "190" series, are for small shops having single-phase supply. Eleven models make up the series.



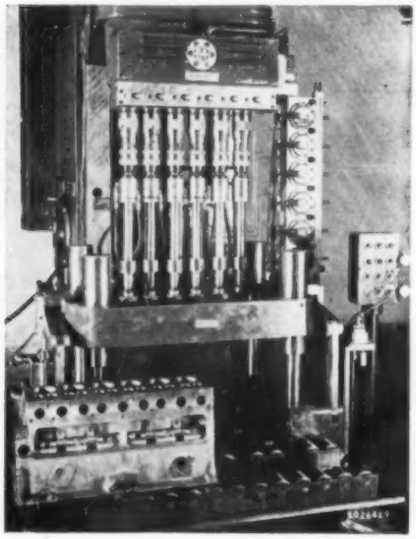
MICROHONING EQUIPMENT—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Line of Microhoning equipment for toolroom use, semi-production and reconditioning work is known as the Microhoner machine and Micromold utility tools. The Model No. 717 machine illustrated is an all-mechanical unit and has a capacity for bore diameters from ½ to 4 in.



SUPERFINISHER—*Gisholt Machine Co., Madison, Wis.* Model 51, 4x18-in., general-purpose model. Two sizes handle work to 18- and 36-in. length and are adaptable for general toolroom use or to Superfinishing comparatively small lots of a variety of cylindrical parts.



LAPPING MACHINE — *Size Control Co., Div. American Gage & Machine Co., 2500 Washington Blvd., Chicago 12, Ill.* A dual-roll centerless lapping machine is said to give accuracy of less than 2 microinches on cylindrical pieces.



FLAT-LAPPING—*Spitfire Tools, Inc., 2933 Pulaski Rd., Chicago 41, Ill.* Flat-lapping machine for large and small surfaces handles metals, glass, quartz and other materials. No lubrication is necessary. Floor space is 19x19-in.

SURFACE FINISHER—*Norton Co., Worcester 6, Mass.* No. 12 Simplex surface-finishing machine incorporates the features of the Crank-O-Lap into a simplified design. Capacity is ½- to 2½-in. dia. with lengths to 12 in. The machine can finish several bearings simultaneously by supplying the required number of lapping arms.

HONING — *Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* A honing tool and head that automatically controls the finished bore size of automotive cylinders can be applied to all types of bores over 2-in. dia. The Barnsdril honing machine illustrated is equipped with a Micromatic Hydrosize six-spindle head, tools and fixtures, has a 30-sec. honing cycle. It removes an average 0.004-in. stock from each of six bores, to hold the bore size to not over 0.0005-in. variation. Feed-out, collapse, withdrawal of tool and compensation for abrasive wear are automatic.

LAPPING MACHINE—*Norton Co., Worcester 6, Mass.* No. 16 FC lapping machine is a universal machine handling flat and cylindrical work. It will handle flat work to 3-in. thickness and 4-in. length, and cylindrical work of 1-in. dia. by 5-in. length.

SEAL-O-LAP—*Norton Co., Worcester 6, Mass.* Seal-O-Lap lapping machine is designed to produce a flat, "seal" surface on component of rotary seal devices. It can also do flat lapping on work to 7-in. dia. It has an oscillating, rotating, single work-drive spindle and a rotating lower lap-drive spindle.

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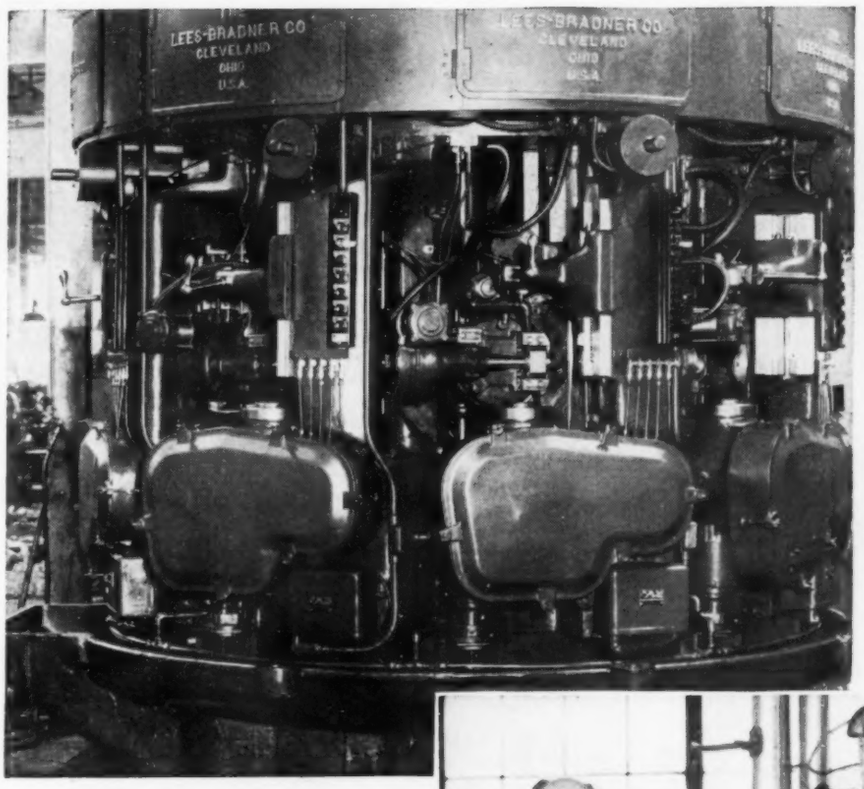
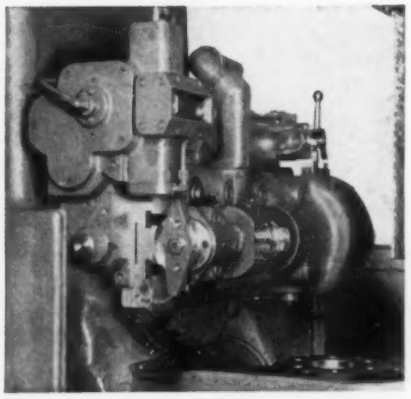
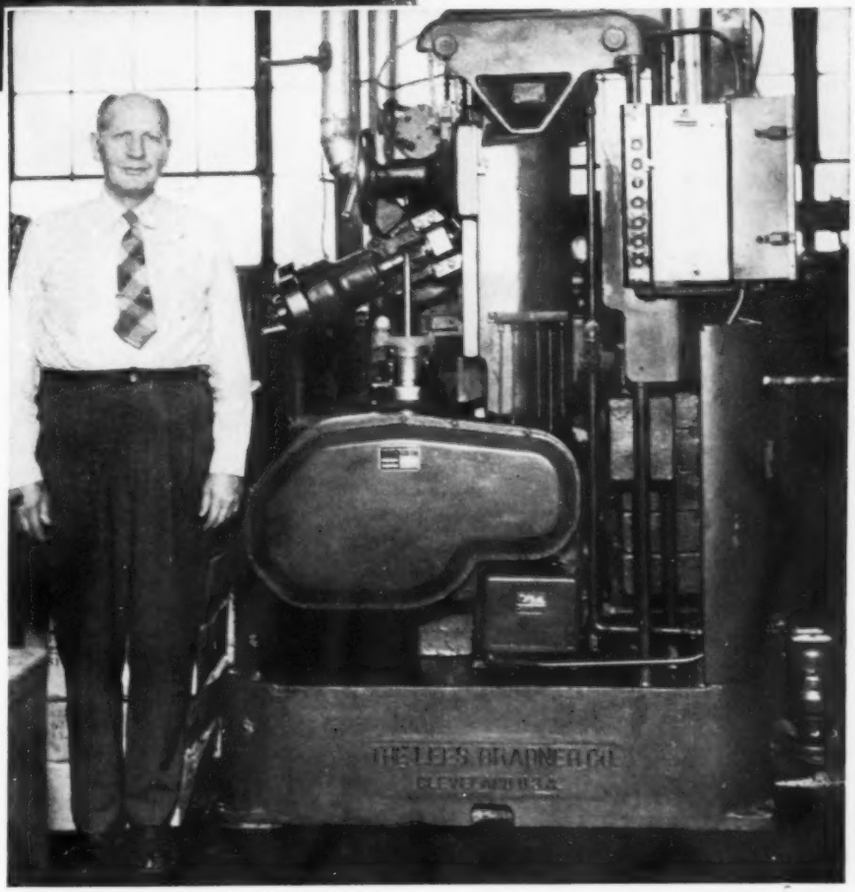
Gear Cutting and Finishing



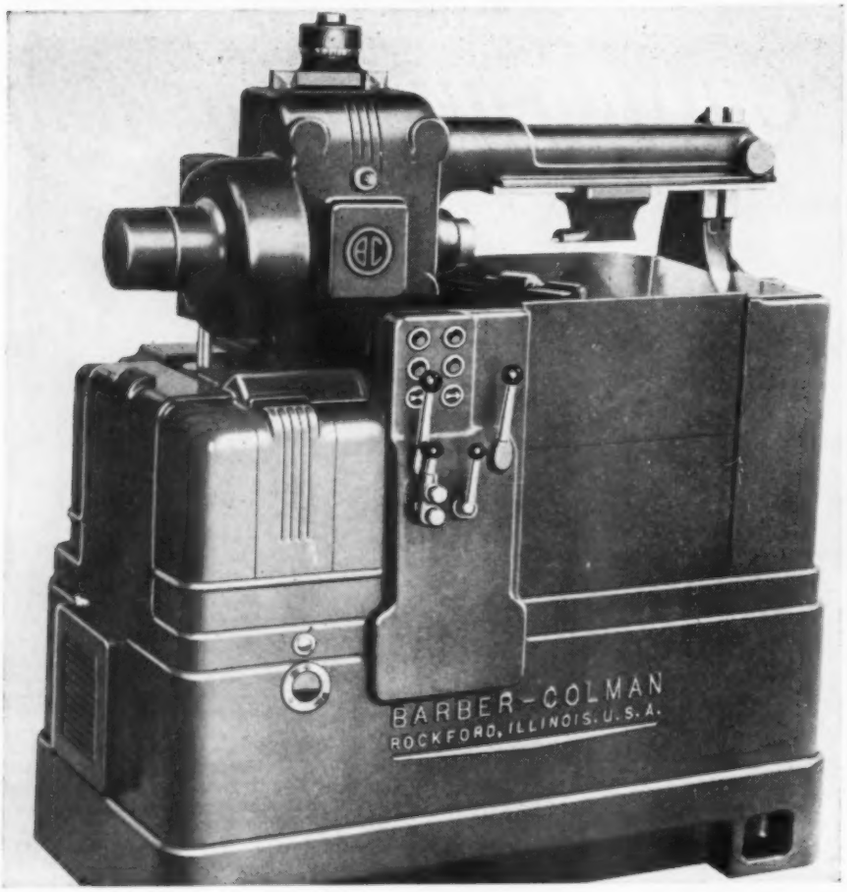
PRODUCTION HOBBER—*Lees-Bradner Co., Cleveland 11, Ohio.* 7-A production hobbing machine is built in single-, 4-, 6- and 8-spindle (illustrated) models. Each spindle can be tooled for same or different job. Tools have pushbutton control with automatic or manual operation. A lead-differential headstock has also been developed to facilitate handling qualified or registered helical gears. With this headstock, index gearing consists only of idlers and a change gear having the number of teeth or a multiple of the number of teeth in the blank to be cut.



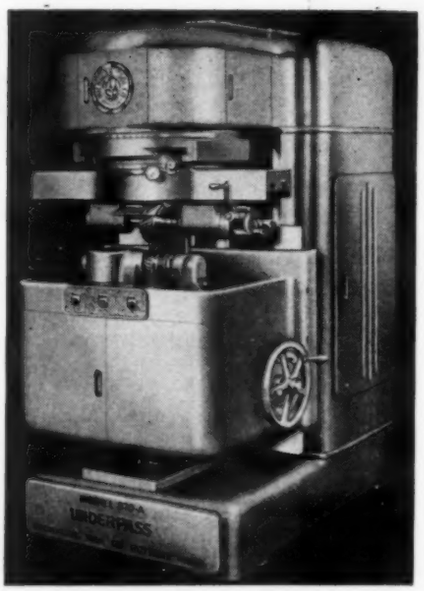
HOB SHIFTER—*Barber-Colman Co., Rockford, Ill.* For use on the No. 8-10 vertical cycling production hobbing machine, the hob shifter changes position of hob after each cycle. It spreads heavy wear of roughing cut evenly over all the teeth. Shifter indexes hob by a predetermined increment from zero to 0.450 in. every cycle, using hobbing machine's hydraulic fluid for power.



HOBBING MACHINE — *The Lees-Bradner Co., Cleveland 11, Ohio.* Model 8-B Hobbing Machine is for hobbing of timing gears with carbide-tipped hobs. It has been used for finish-hobbing fabric timing gears in one cut, hobbing aluminum timing gears in one cut previous to finish-shaving. Experimental work on cast iron and steel awaits only development of suitable hobs. →

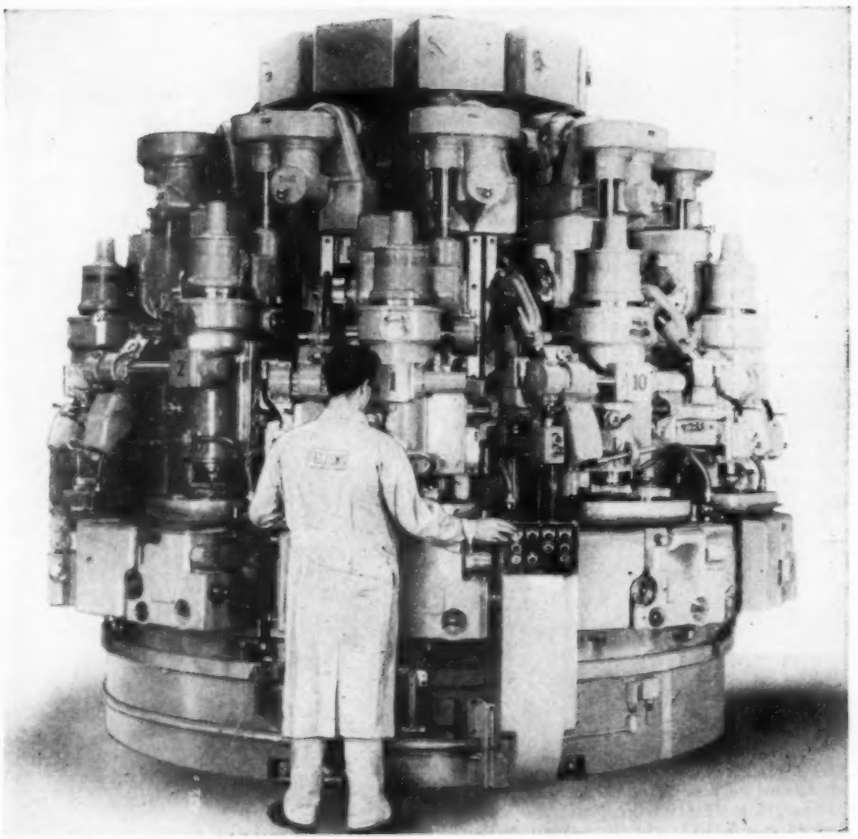


HOBBING MACHINE — *Barber-Colman Co., Rockford, Ill.* No. 8-12 production hobbing machine provides semi-automatic cycling, speed for carbide hobbing, conventional and climb hobbing in either direction. Takes work to 8-in. dia. on some pitches and has hob-slide travel of 12 in. Max. tooth form is 10 diametrical pitch. Max. hob dia. is 2¼ in.

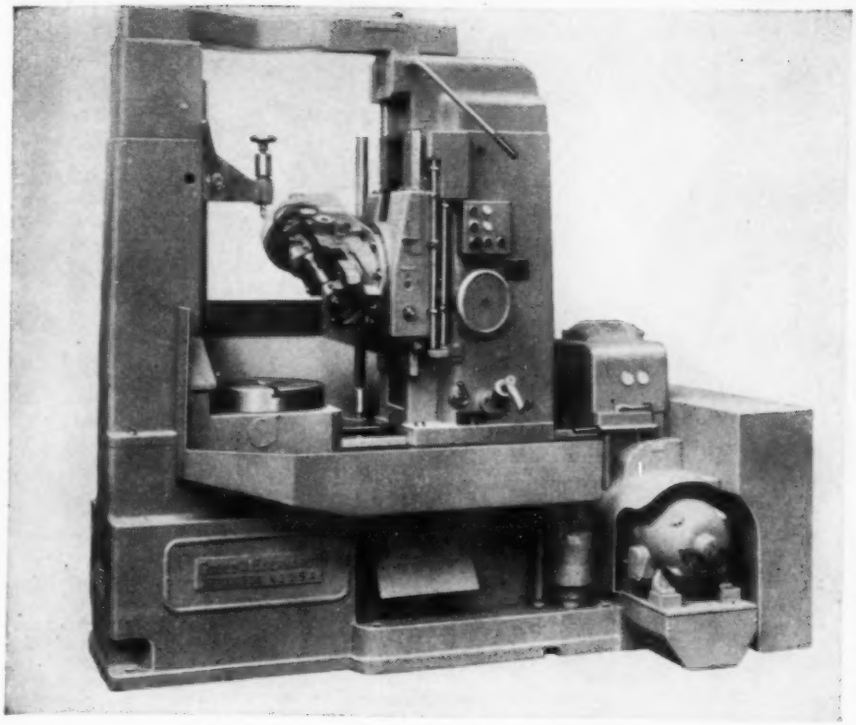


ROTARY GEAR FINISHERS—*Michigan Tool Company, 7171 E. McNichols Rd., Detroit 12, Mich.* Two models and three sizes are included in the line of high-production "crossed-axis" universal rotary gear finishers. These models have a reciprocating cross-slide which carries the gear to be finished. The three sizes handle 8-, 12- and 18-in. max. dia. gears. Minimum diameter of work is one inch in all three sizes. Maximum face width is 5 in.

GEAR SHAPER—*Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich.* Shear-Speed gear shaper carries one cutter blade for each tooth to be cut. Gear blank is chucked on a reciprocating member and the head lowered with cutter blades retracted radially outward.



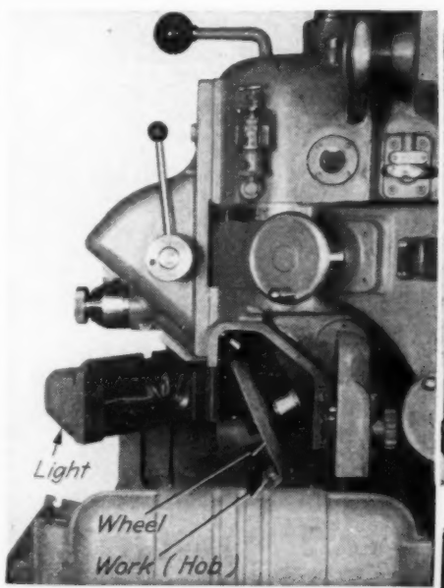
GEAR SHAPER—*The Fellows Gear Shaper Co., Springfield, Vt.* The No. 10 rotary gear shaper comprises ten individual and complete gear-cutting units, turret-mounted to rotate in either direction on a single base. Each unit can be arranged for a different gear, or all units can be set up on the same gear. Capacities of the machine are: 12-in. pitch dia., 3-in. face width, and diametral pitch of spur ¾, helical 5/7.

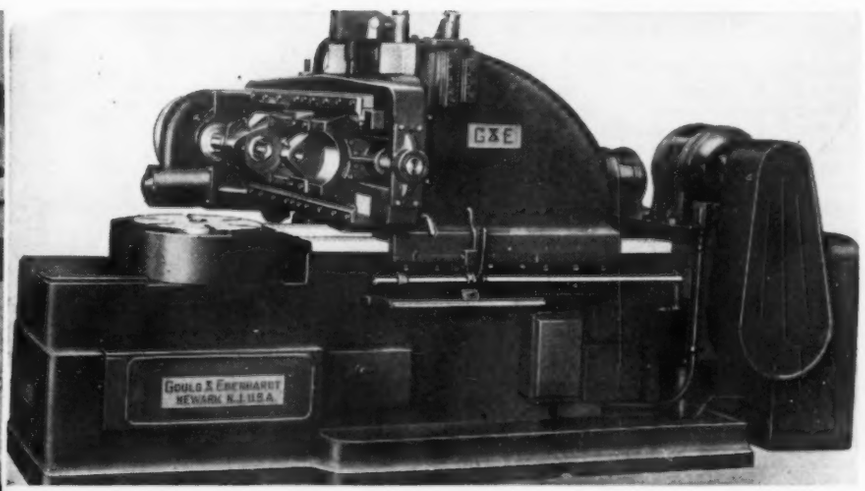


GEAR HOBBERS—*Gould & Eberhardt, Inc., Irvington 11, N. J.* Gear-hobbing machines in 12H, 24H and 48H sizes are for cutting spur gears, helical gears either differentially or nondifferentially, and worm gears by the infeed method. Machines are electrified and pushbutton operated. They can be arranged for hobbing splines or ←worms with low numbers of teeth.

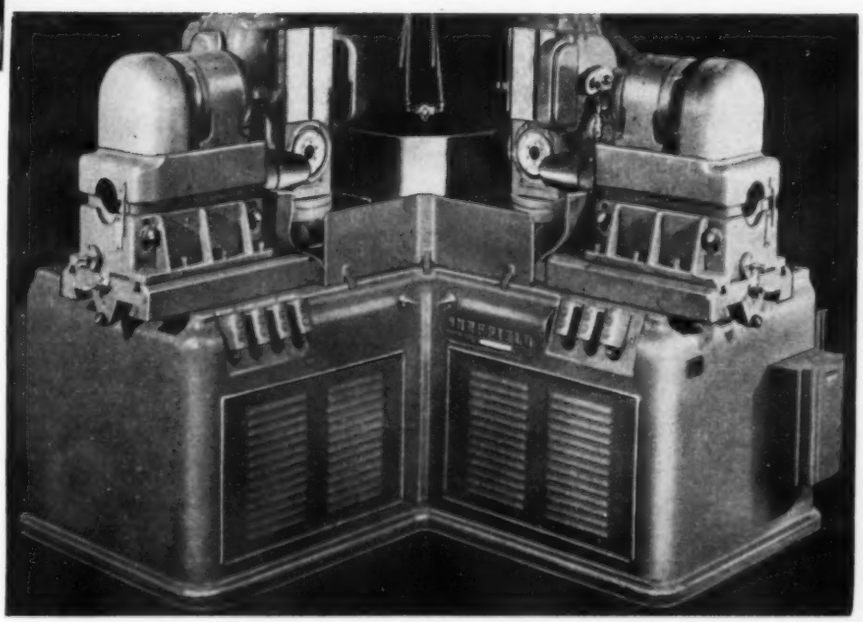
GEAR GRINDER — *Gear-Grinding Machine Co., Detroit 11, Mich.* Type GG 10x24-in. gear grinder features automatic variable harmonic downfeed, automatic cycling of tooth grinding, and wheel truing set up to handle two grinding wheels at a time. Automatic control is by electric and hydraulic means. Table speeds are to 70 fpm.

WORM HOBBERS—*Gould & Eberhardt, Inc., Irvington 11, N. J.* A line of machines is for production of single- and multiple-thread worm gears. They have both automatic infeed and tangential feed for production of worm gears with hobs or fly cutters. Gears of ratios from 1:1½ to 1:100 and greater can be produced. ↓

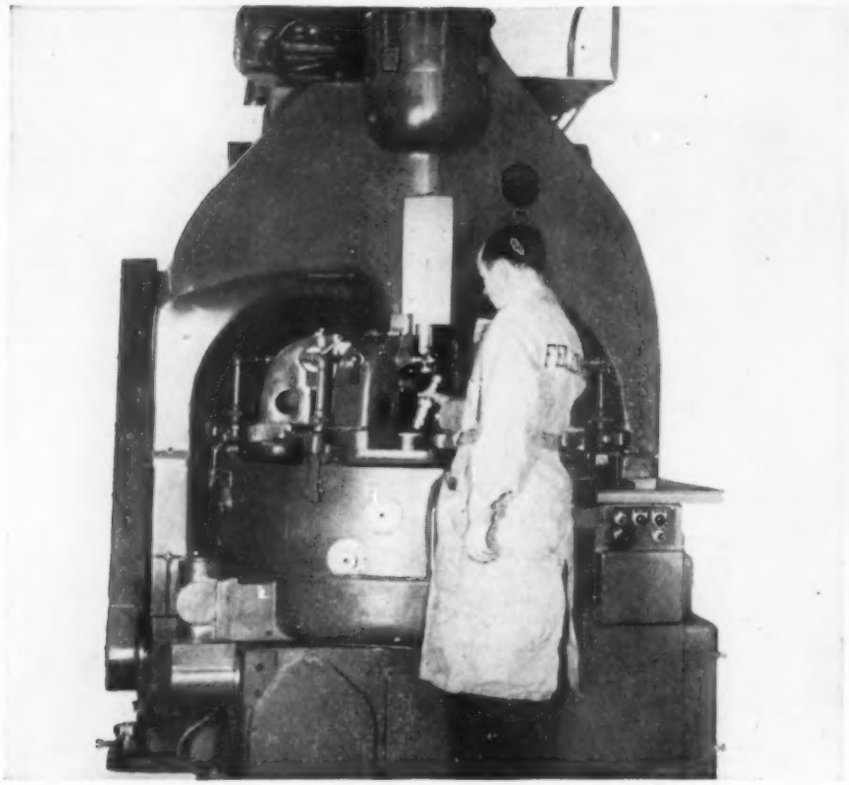




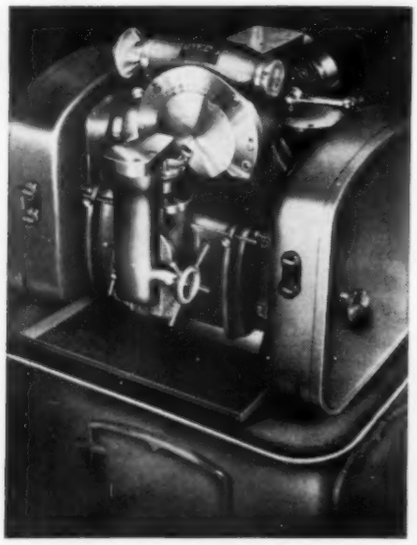
HOB SHARPENER—*Barber-Colman Co., Rockford, Ill.* Accommodating high-speed steel and carbide hobs, the No. 6-5 hob sharpener operates at 5 to 20 cycles per min. with table stroke of 3 to 8 in. There are three motors, one for the spindle which provides wheel speeds of 3600, 4300 and 5000 rpm. A built-in tangent bar permits high accuracy.



CHAMFERING MACHINES — *Sheffield Corp., Dayton 1, Ohio.* Six redesigned models are built for standard high-speed steel cutters, and two models for carbide cutters. All can be made in either single- or twin-head style. Two models are of quick-change or small-run type which can also be used for production, while six models are strictly for production. →



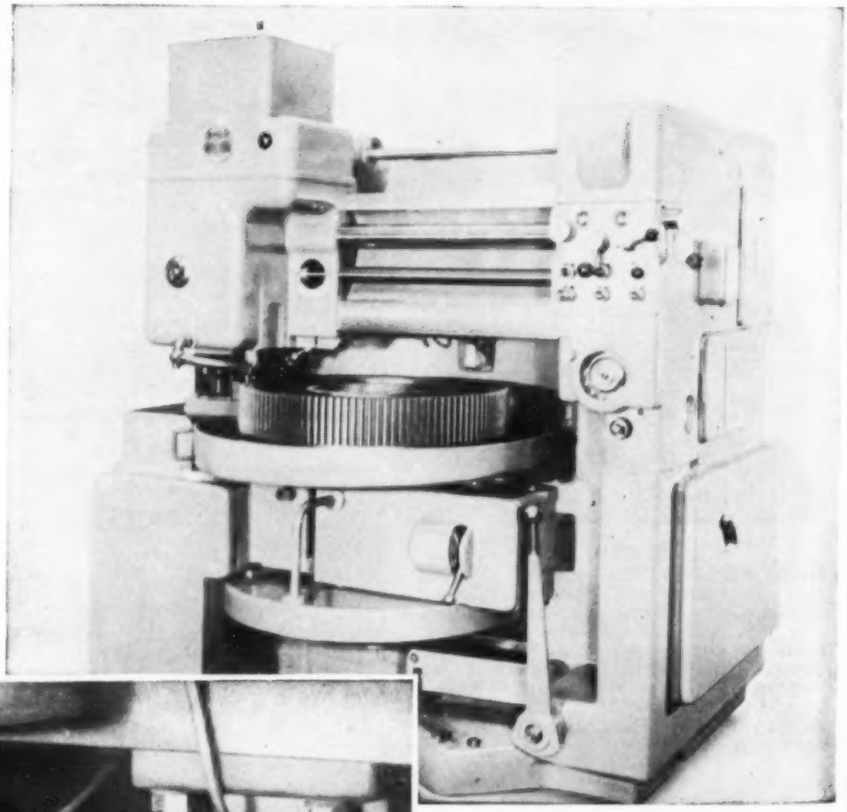
PLANETARY GEAR SHAPER—*Fellows Gear Shaper Co., Springfield, Vt.* Work planets about a large gap-type cutter which is reciprocated, but does not rotate, on this machine. Work is held on individual work-spindles carried in the rotating turret. Gap-type cutter is about 15 in. in diameter.

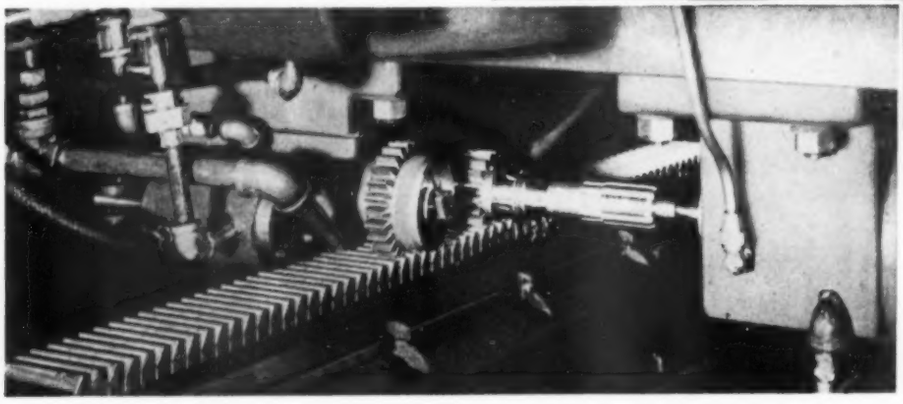


GEAR GENERATOR—*Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.* The fine-pitch gear generator employs full generating process said to combine advantages of shaping and hobbing methods. Produces spur or helical involute gears from the smallest practical diameter to 3 in. with semi- or full-automatic magazine feeding.

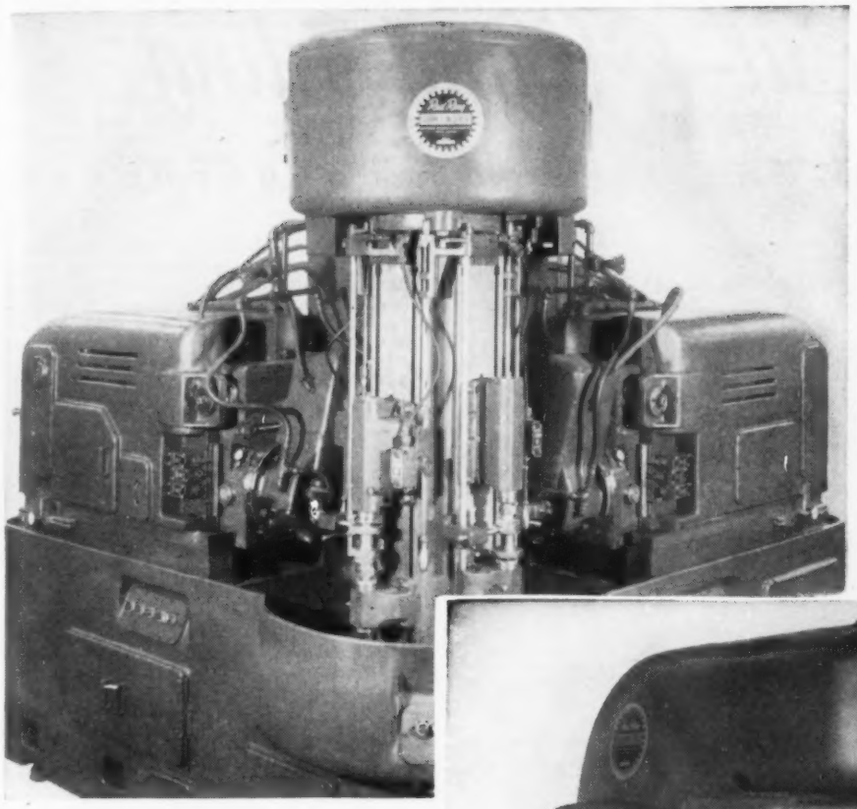
RED RING ROTO SHAVER—*National Broach & Machine Co., 5600 St. Jean Ave., Detroit, Mich.* Unit shaves laminations of motor rotors from the rough in one operation. Incorporating the principle of crossed-axes shaving, the machine is said to eliminate the need for a final operation to reopen rotor laminations.

DUPLEX HEAD—*Michigan Tool Company, 7171 E. McNichols Rd., Detroit 12, Mich.* A duplex head makes it possible to shave two gears at the same time on the crossed-axes gear shaver. Cluster gear is mounted between centers, while the other is carried on a stub arbor.



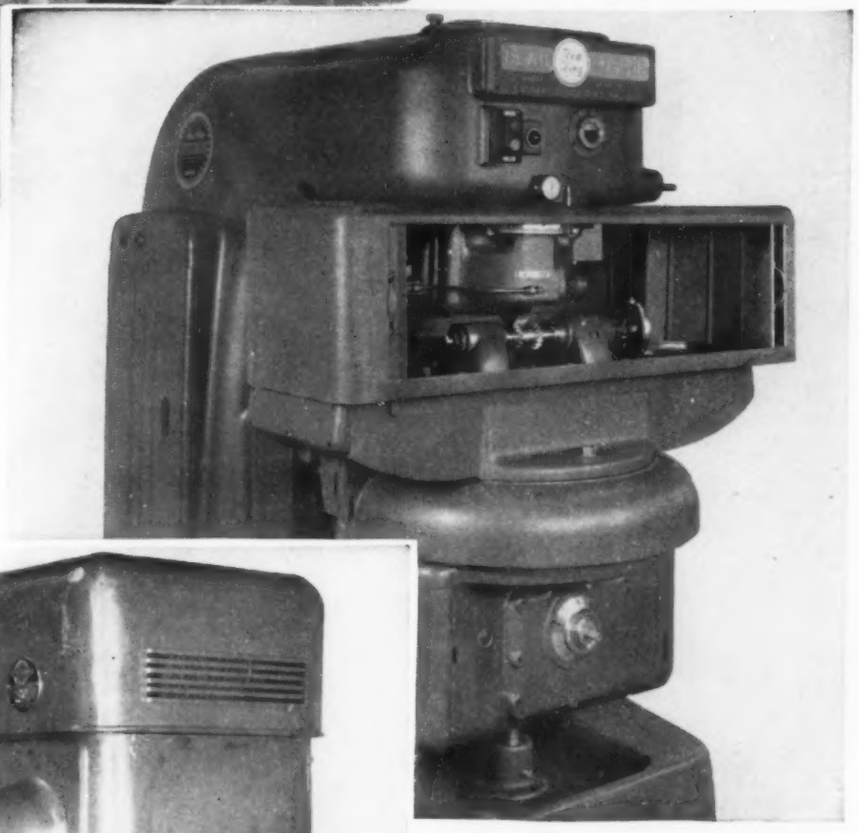


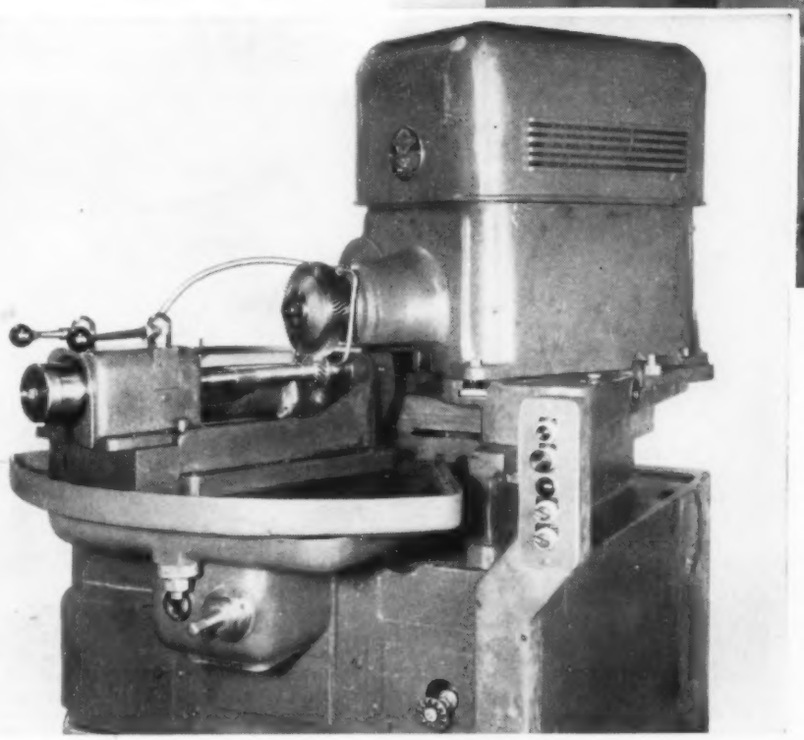
GEAR SHAPER — *Fellows Gear Shaper Co., Springfield, Vt.* A 36-in. gear shaper for general-purpose gear cutting is adapted to cutting of internal and external spur and helical gears. The one-piece cutter spindle takes a 5-in. cutter and is operated by a heavy reciprocating mechanism. The cutter can be fed into depth by independently adjustable steps determined by the number and position of dogs. There are 12 reciprocating speeds from 18 to 300 strokes per min.



GEAR-SHAVING—*National Broach & Machine Co., 5628 St. Jean at Drummond, Detroit, Mich.* The model GCS Turmatic, a Red Ring gear-shaving machine, has two cutting stations and four work stations. It incorporates the principle of crossed-axes shaving. The central turret is equipped with four vertical sets of headstock and tailstock. Two cutter heads spaced 90° apart simultaneously mesh with work gears on adjacent turret faces.

BURNISHING MACHINE—*Sheffield Corp., Dayton 1, Ohio.* Unit is designed to iron out the irregularities on the tooth profile, compress the surface metal and form a denser and tougher structure of gear teeth. Gears are burnished after heat-treating to reset the metal and correct distortion of tooth spacing occurring during hardening.





GEAR SHAVER—*National Broach & Machine Co., 5600 St. Jean Ave., Detroit, Mich.* Red Ring diagonal gear-shaving machine feeds work at an angle to its axis, the angle being selected with reference to the dimensional and physical characteristics of gear being shaved. This traverse is said to remove more stock per cycle in less cutting time.

GEAR-SHAVING MACHINE — *The Fellows Gear Shaper Co., Springfield, Vt.* The No. 8 "Full-Tool" gear-shaving machine incorporates a method of cross-axes shaving in which axis of work is set up at an angle relative to tool reciprocation. Maximum pitch diameter of work is 8 in., maximum face width is 2½ in., and maximum ← stroke is 4 in.

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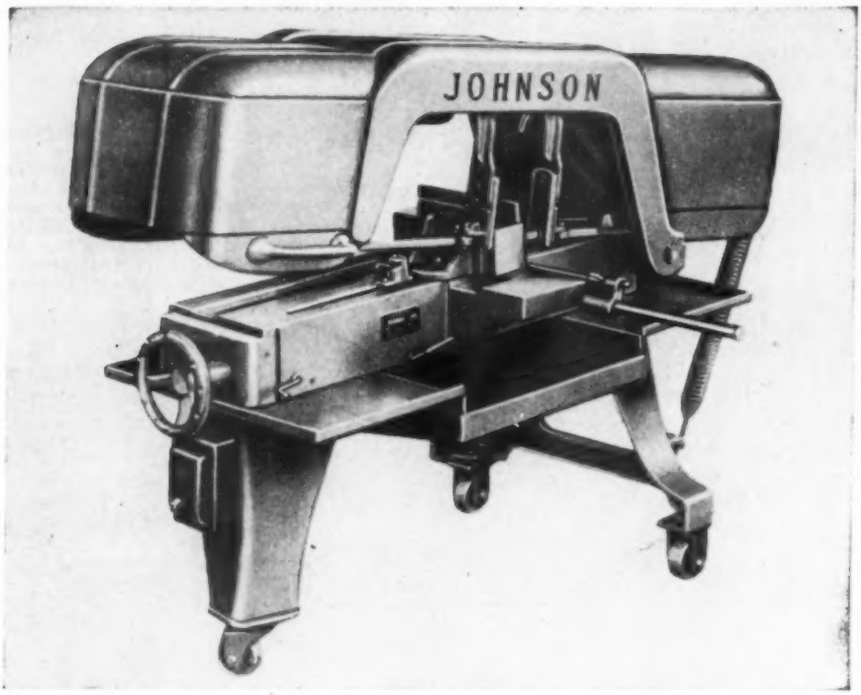
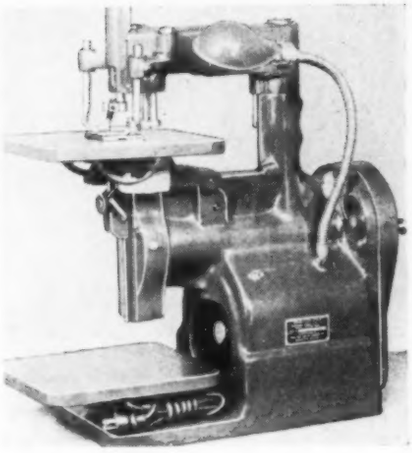
Cut-Off and Filing

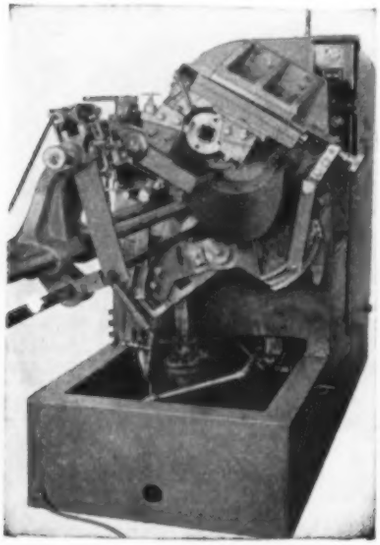


BANDSAW—*Johnson Mfg. Corp., Rm. 624, Chrysler Bldg., New York 17, N. Y.* Horizontal wet model has 10x18-in. capacity. Coolant plays directly on cut from nozzle fastened to back of front saw guide. Pump starts and stops automatically, is integral, can be disconnected for dry cutting.

BANDSAW—*Walker-Turner Co., Inc., Plainfield, N. J.* A metal-cutting bandsaw with variable speeds from 82 to 5023 fpm. has no pulleys. A power-feeding mechanism controlled by resistance to the blade is said to provide protection against overloading and to prevent distortion of blade.



DIE, PUNCH MAKING—*Ideal Tool and Die Co., Inc., 733-35 Congress St., Schenectady 3, N. Y.* Synchronized Duplex die- and punch-making machine using needle files and saws 1/32 in. thick and up will operate at a speed of 525 strokes per min. for cutting at lighter pressures possible with needle files and saws, and at a lower speed of 325 strokes per min.



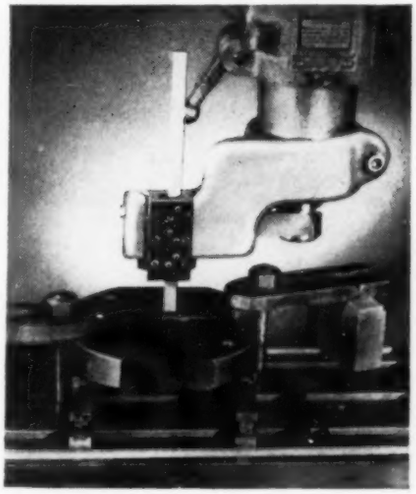
CUTTING-OFF MACHINE—*Modern Machine Tool Co., Jackson, Mich.* An automatic machine, for cutting off tubing, pipe or solid bar stock, has double live-roll stock feed which will feed any length of stock through the spindle. As stock strikes a trip plate on the stop, an automatic cycle is started, taking about 1½ sec. plus cutting time.

BANDSAWS—*DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Light-production bandsaws have throat depth of 16 in. and work-thickness capacity of 12⅛ in. Model HS-4 has 2,000, 3,000, 4,000 and 5,000 fpm. speed through a 4-step pulley. Model LB has variable-speed ranges of 100 to 300 and 1700 to 5100 fpm. through transmission and the speedmaster. Variable-speed drive.

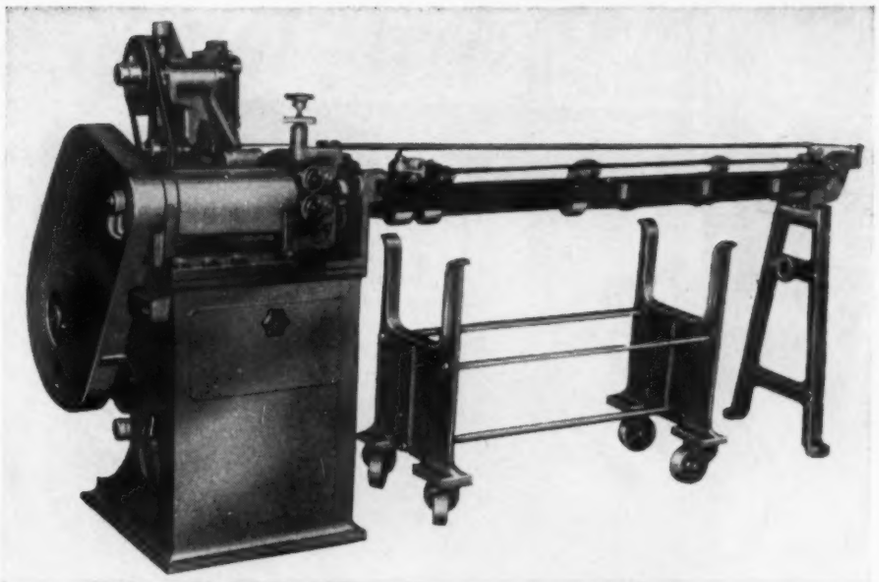
CUT-OFF MACHINE—*The Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn.* Automatic cut-off machine, completely hydraulic in operation, will automatically cut off stock in lengths to 12 ft. It will handle stock of 2-in. dia.

BANDSAW — *Armstrong-Blum Mfg. Co., 5700-5800 W. Bloomingdale Ave., Chicago 39, Ill.* No. 15 hydraulic bandsawing machine employs high-speed steel endless bandsaw blade 1½ in. wide and 0.072 in. thick with widely spaced teeth. Machine will cut solid bars of tough steel to 15 in. square.

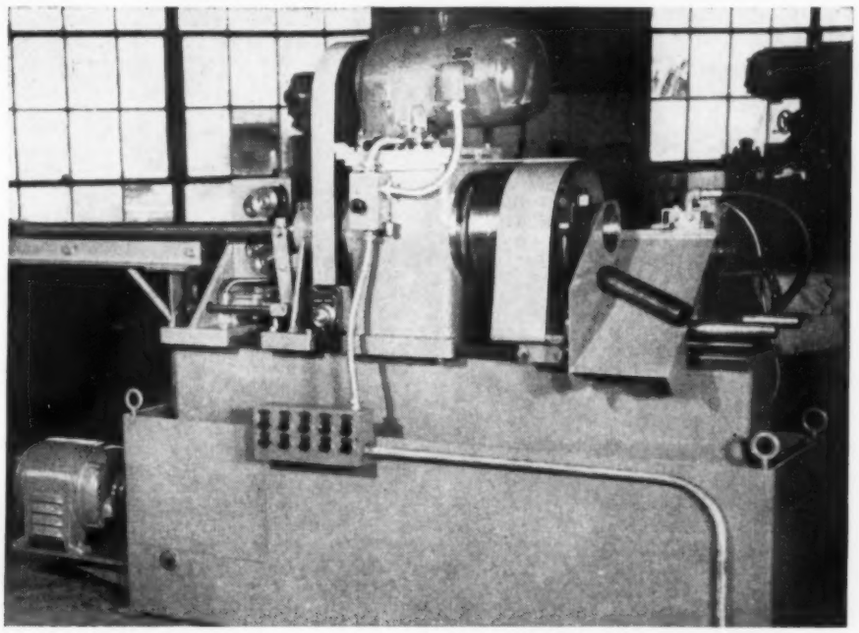
BANDSAW—*Roll-In Saw Co., Dept. No. 36, Parma, Mich.* Unit operates on principle of gravity feed, acts as two machines. As cutoff saw with gravity feed, the blade rolls into work with correct pressure automatic, saving wear on blades. For contour work, blade is locked in stationary position with clamp.

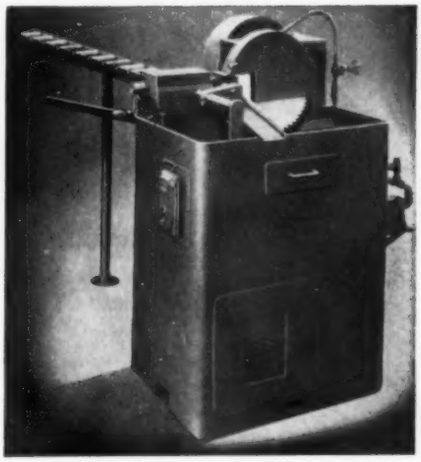


FILE ATTACHMENT—*W & W Tool & Die, Inc., Midland, Mich.* Will-Wood attachment permits use of ordinary mill files with index machines and Bridgeport milling machines. Filing speed is controlled by spindle speed. File stroke is ½ in.



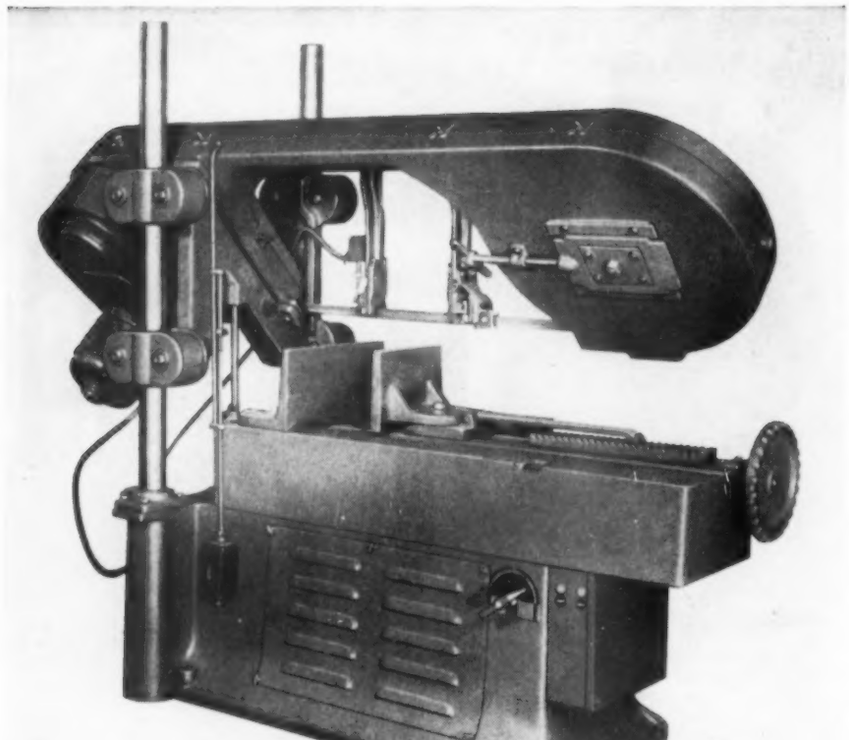
WIRE-STRAIGHTENING—*Dore Mfg. Co., Inc., Grayling, Mich.* Cut-off and wire straightening machine has capacity from 0.040- to 0.156-in. dia. wire. Production is said to be 10,000 pieces per hr., based on the straightening and cutting off of 9-in. lengths of 0.040-in. dia. wire.





CUT-OFF MACHINE—*Pines Engineering Co., Inc., 690 Walnut St., Aurora, Ill.* The series 800 rotary cut-off machine, Size 2½, is completely automatic. Stock passes through the spindle at a rate of 250 fpm. Complete cycle exclusive of feeding or cutting time, takes 1½ sec. Tubing or pipe from ½- to 2⅞-in. O.D. can be cut.

←
SAWING UNIT—*Cochrane-Bly Co., 3 St. James St., Rochester 6, N. Y.* The No. 22 metal-sawing machine for ferrous and non-ferrous metals and plastics has a capacity for stock to 2-in. dia., and is available in automatic, semi-automatic and hand-operated models. Stock-gage capacity is 9 in.

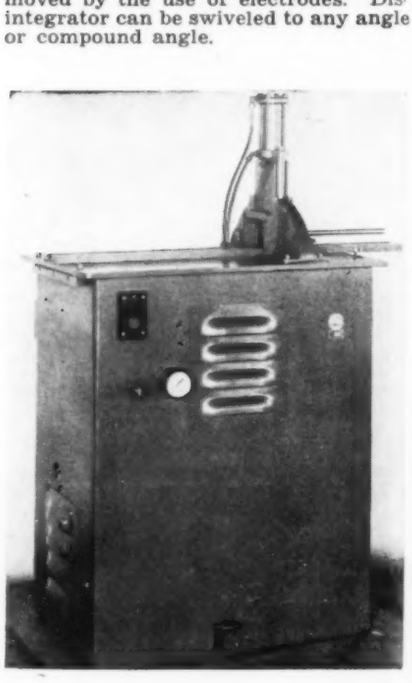


BANDSAW—*Wells Mfg. Corp., Three Rivers, Mich.* No. 12 heavy-duty horizontal metal-cutting bandsaw cuts off rectangular stock to 12 in. deep by 16 in. wide or to 12¾-in. dia. The cutting cycle is automatic. It can be automatically controlled to cut to any desired depth.

CUT-OFF UNIT—*George H. Bullard Co., Inc., Westboro, Mass.* Hydraulic cutoff machine handles hardest steel to softest non-ferrous metal. Recommended for use with 14x3/32x1-in., resinoid-bonded wheels, the unit has fully enclosed abrasive wheel. The 3,500-rpm. spindle gives 13,500-sfpm. speed to the wheel. →

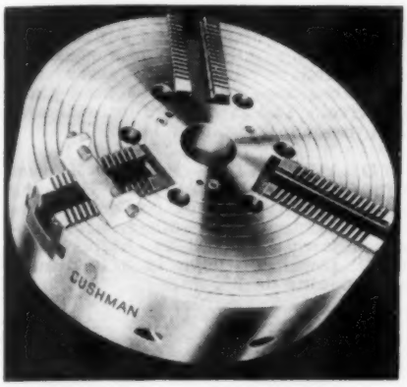
BENCH FILER—*The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Model FH-10, for filing, sawing and honing operations, has ¼-hp. motor and gives approximately 350 strokes per min. It has 1½-in. stroke and ⅛- to ⅜-in. ←file-shank capacity.

DISINTEGRATOR—*Ansaldi Tool & Engineering Co., 4744 Twelfth St., Detroit 8, Mich.* Automatic disintegrator removes taps, drills, studs, and reamers from die sections, castings, hardened steel, and most alloys without distorting part. Obstructions are removed by the use of electrodes. Disintegrator can be swiveled to any angle or compound angle.



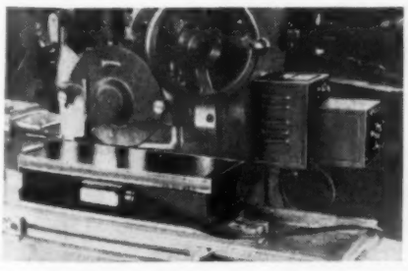
AMERICAN MACHINIST 35th ANNUAL REVIEW

Tools and Accessories



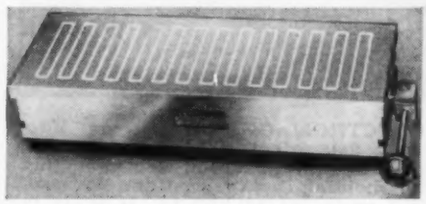
CHUCKS—*The Cushman Chuck Co., Hartford, Conn.* Line includes air-operated power chucks, air cylinders and control equipment. Chucks include several air-operated power types, 2-jaw gib- and round-body types, and collet types.

CHUCK—*Edward Blake Co., 634 Commonwealth Ave., Newton Centre 59, Mass.* Small-lathe precision chuck, similar in many ways to a collet chuck, is called the Bordjaw chuck. Unit has lateral movement only and can be faced and bored after mounting on lathe. Made for lathes with spindle nose threaded 1½-in.-8.

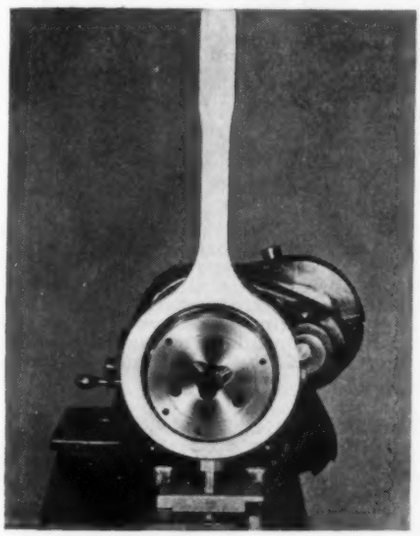


MAGNETIC CHUCKS—*Hanchett Mfg. Co., Big Rapids, Mich.* Laminated-top magnetic chucks are equipped with the Neutrofier combination rectifier and demagnetizer. The chucks are laminated-top Hermati-Coil magnetic chucks, sizes 6x24 in. and smaller. Snapping control switch demagnetizes chuck and part in few seconds.

CHUCK—*Skinner Chuck Co., New Britain, Conn.* Compensating power chuck with two floating non-adjustable jaws drives work on centers where exceptionally heavy cuts are to be taken.

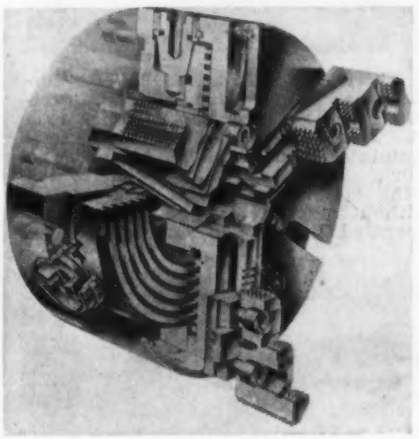


MAGNETIC CHUCK—*O. S. Walker Co., Inc., Worcester, Mass.* A permanent chuck 6x18-in., weighs 90 lb. Design is 45 lb. less than original. Holding force has been increased by 5%. Similar improvements have been made in the 4x8- and 5x10-in. sizes.

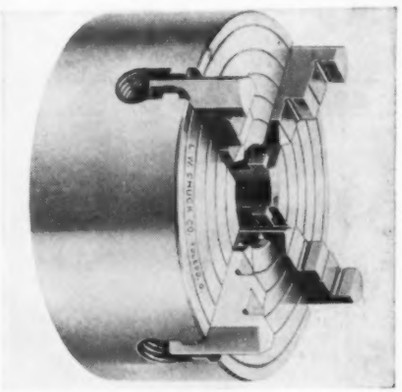


SPEED CHUCK—*Airo Products Co., 2938 Denby Ave., Los Angeles 26, Calif.* Model No. 3E1 Fry Multi-Duty, is said to combine advantages of both collet and jaw chuck, and to be adjustable to concentric or eccentric work. It can be opened or closed in motion. Capacity is ⅛ to 1 in. round, ⅞ in. hexagon, and ¾ in. square.

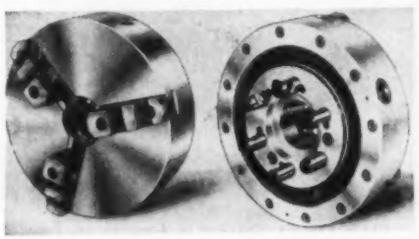
KNIFE BAR—*Hanchett Mfg. Co., Big Rapids, Mich.* An electro-magnetic knife bar with 22% more work area is said to have uniform distribution of magnetism and to hold knives to the extreme edge of the bar. The bar assembly is mounted on journal brackets and swivels 360° by means of a handwheel.



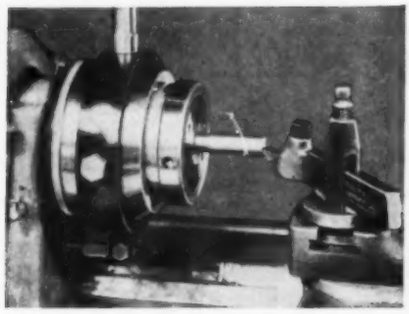
CHUCKS—*Warner and Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Line of scroll chucks in sizes from 8 to 24 in. are adaptable to all models of lathes having American Standard flange-type spindle nose.



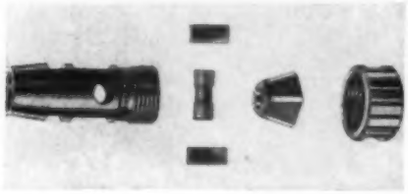
INDEPENDENT CHUCKS — *L-W Chuck Co., 25 S. St. Clair St., Toledo, Ohio.* 8-in. medium-duty and 6-in. heavy-duty (shown above) 4-jaw independent chucks are for small lathes. Adapter backplates with 1½ in.-8 thread suitable for some Atlas, South Bend and Logan lathes are available.



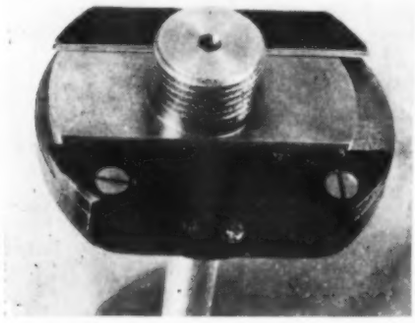
BODY CHUCK—*The Whiton Machine Co., 509 Howard St., New London, Conn.* Chuck is made of Whit-Aloy, a special-analysis aluminum. It is a hand-operated chuck, models of which are made for direct mounting on American standard spindle nose type D-1.



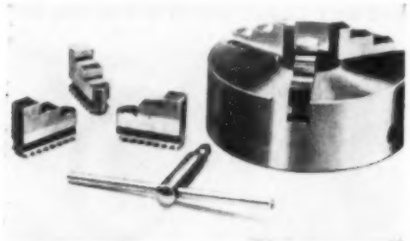
CHUCK—*Porst Bros., 259 N. California Ave., Chicago 12, Ill.* The Levermatic collet chuck has capacity to 1 in. A selective adjustment ring will maintain predetermined pressure on work. The chuck threads on to the lathe spindle nose and is operated, without stopping spindle, by a hand-operated shifting lever.



TAP CHUCK—*Jacobs Mfg. Co., 100 Jacobs Rd., Hartford 1, Conn.* A small tap chuck which incorporates the Jacobs Rubber-Flex collet designed in three models for tapping heads and machines, and covers a range from No. O machine screw to ⅝-in. hand tap.

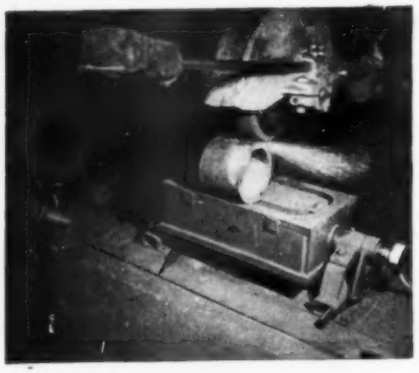


CHUCK—*H. D. Chambliss, 111 Clarion Rd., Oak Ridge, Tenn.* An elliptical chuck fastens to the nose of a lathe and holds conventional chucks or faceplates. These in turn hold work which can be turned or bored into elliptical shapes.

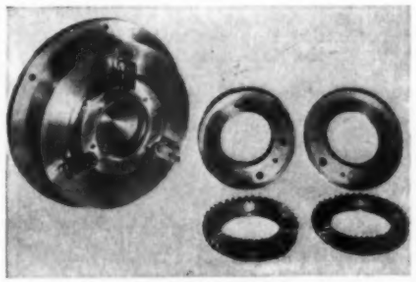


LATHE CHUCK—*Falls Products, Inc., 120 N. Genoa St., Genoa, Ill.* The 5U 5-in. universal 3-jaw lathe chuck with three hardened alloy pinions is threaded to mount directly on lathes with 1½ in.-8 spindle threads and can be adapted to others. Two sets of jaws for internal and external grip are provided. Also available is a 6-in. 4-jaw chuck with same mounting.

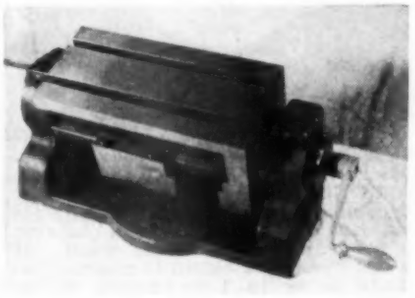
SPACERS—*Industrial Products Suppliers, 108 Water St., New York 5, N. Y.* Plastic slitting-machine spacers in different colors to aid in telling thickness are available in any size up to 20-in. dia.



ELECTROMAGNET — *Dings Magnetic Separator Co., Milwaukee, Wis.* Hold-Tite Magnet, an electro-magnet for holding heavy castings in position under swing grinder, is made in 16x29½- and 16x16-in. sizes. Available on a tilting trunnion with seven positions, or as base magnet.

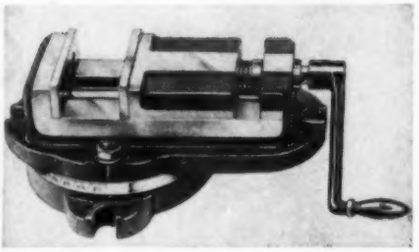


CHUCK—*Garrison Machine Works, Inc., 515-525 Bannock St., Dayton 4, Ohio.* Draw-bar type gear chuck has interchangeable locating rings for handling different gears. Chuck is used for locating bevel gears by pitch line of teeth while grinding bore and a portion of the back face at one chucking.



VISE—*Conrad Machine Co., Route 53 and Hoy Rd., Lombard Ill.* Trunnion-mounted 5x5x1¼-in. vise backed by 5x10-in. surface plate with ⅜-in. T-slots. Unit can be rotated 360° and clamped at any angle to accommodate index or angle work for milling, grinding or drilling.

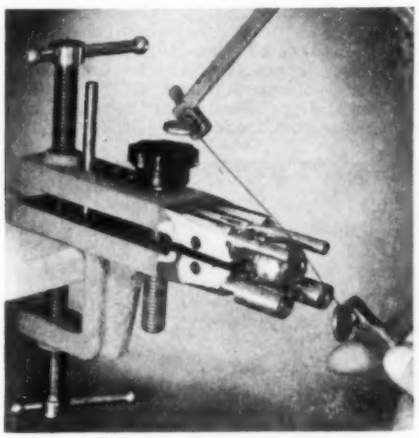
AIR VISE—*Production Devices, Inc., Whitehall, N. Y.* The Airlox vise kit consists of an air vise, a 5-ft. hose and a latching foot valve. A jaw-stroke limit screw provides ¼-in. stroke anywhere in the 2-in. jaw opening. Full 2-in. stroke can be obtained if screw is removed. Gripping force is 5x air pressure.



VISE—*L-W Chuck Company, 25 South St. Clair St., Toledo, Ohio.* 3-in. swivel-base vise for milling machines, shapers, grinders and drillpresses has graduated base and can be used plain or swivel. The jaws are 3 in. wide and 1 in. deep. Weight is 16 lb.

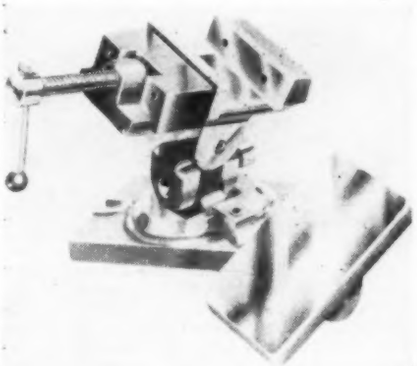
HYDRAULIC VISE—*Made by Munton Mfg. Co., Franklin Park, Ill.* Unit has 2-ton capacity, is foot powered. One pedal tightens, the other pedal releases jaws. It is 3 in. high, 15 in. long. Depth of jaws is 2 in.; max. jaw opening is 2½ in.

HAND VISE—*Chicago Tool & Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* Palmgren No. 15 hand vise weighs 7 oz., is 5 in. long and has 1½-in. jaws which open to 1½ in.

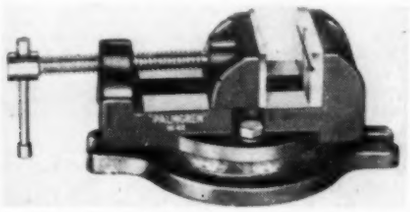


VISE—*Benj. Uydess & Sons, Inc., 962 East 167th St., Bronx 59, N. Y.* Bench-King vise with tool-steel fingers allows work of odd shapes to be handled without use of special setups. Thicknesses from 0.001 in., to 2½ in. can be held at any point within the jaws.

VISE—*Reypo Corp., 9900 Lincoln Blvd., Los Angeles 45, Calif.* Quick-acting vise has over-all height of 2 in., 1¼-in. jaw width, and maximum jaw opening of 1⅛ in. Work is released by turning screw ½ turn, flicking lock lever, and withdrawing jaw. Accessories include a small hand vise with ⅞-in. jaw opening, vise handle, swivel base and ballbase positioner.



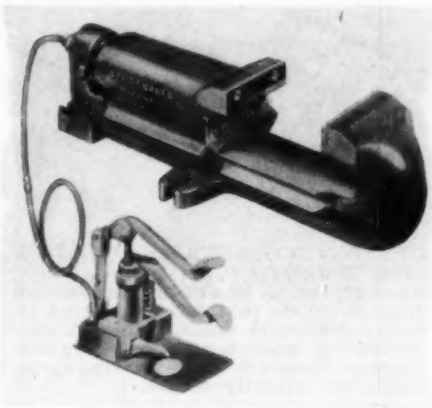
VISE — *Manufacturer's Engineering Service, 400 Security Bank Bldg., Toledo 4, Ohio.* Multi-angle vise and 4x5-in. worktable tilt 45° or more. Both mount on 4x6-in. 360° swivel base. Interchangeable, reversible vise jaws are 3x1 in., open 2 in.



MILLING-MACHINE VISE—*Chicago Tool and Engineering Co., 8354 S. Chicago Ave., Chicago 17, Ill.* A Palmgren milling machine vise, No. 410, with a swivel base affords set-ups at any radius within 360°. The graduated base locks into position when set. The 4-in. jaws open 4 in., and one is grooved horizontally and vertically for holding round pieces. Weight is 21 lb.

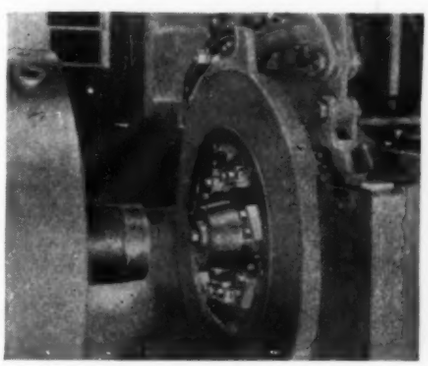
LIVE CENTER—*E. H. Vanderwall Co., 440 Golden Gate Ave., San Francisco, Calif.* Revolving-tip lathe center, with the same dimensions as standard solid centers, has hardened-steel center spindle. Thrust is taken by a replaceable steel ball and thrust plate.

HOLDING TOOL—*Van Products Co., Erie, Pa.* Vi-Speed, a pedal-operated, air-powered holding tool includes vise, air cylinder, foot-pedal valve, air-pressure regulator, gage and hose. The vise jaw is 4½-in. wide, has a max. 7-in. opening and a max. stroke (air) of 1¼ in.

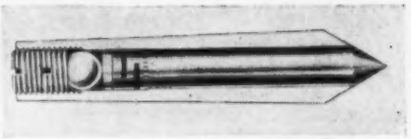


SPEED VISES—*Studebaker Machine Co., 1221 S. 9th Ave., Maywood, Ill.* Two pedal-operated hydraulic Speed-vises have built-in gibs set at 45° angles in V-ways. The vises are self-contained. The No. 750 Torpedo model has 7½-in. maximum jaw opening with 7½-ton maximum squeeze, and the No. 500 Bullet has 5-in. maximum opening with 5-ton maximum squeeze.

VISE—*The Geco, Inc., 30 Grove St., New Canaan, Conn.* The 6-in. Quick-Set vise has a 10-in. rotary index base. Jaws have 7x2 in. area, and the maximum opening is 6½ inches. The base has an automatic spring-loaded index pin which engages the blocks as table is rotated.



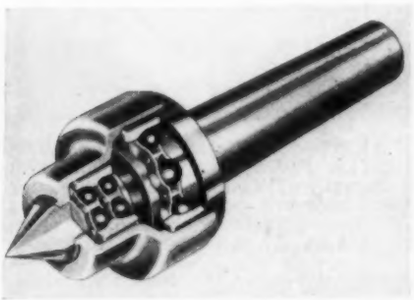
CENTERING PILOT — *Landis Machine Co., Waynesboro, Pa.* Centering pilot, for 8⅝- and 13⅜-in. receding-chaser pipe-threading and cut-off machines, is bolted onto rear of crossrail and forms a center in bore of diehead. This requires removal of cut-off slides, limiting machine to threading. Pilot engages bore of pipe prior to the pipe advancing to the chasers.



LIVE CENTERS—*Samuel S. Gelber Co., 542 W. Washington Blvd., Chicago 6, Ill.* The Star live center has same general dimensions as a standard dead center. Shaft turns in lubricant said to withstand 50,000 psi. Four models have taper from No. 2 to No. 5 Morse, load and thrust capacities from 250 to 600 lb., and over-all length from 4½ to 9 in.

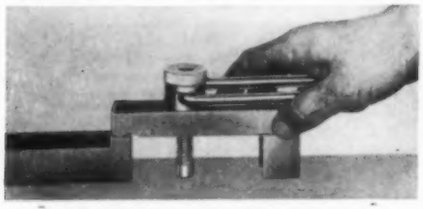
CENTER—*Acme-Danneman Co., Inc., 203-205 Lafayette St., New York 12, N. Y.* The "Cent-A-Matic" is designed to be placed in the headstock of a lathe or cylindrical grinder. In a lathe, the Model 10 eliminates use of a lathe dog. Model 20, for grinders, is for grinding diameters to shoulders. Center drill can vary 3/32 in. on both units.

BALL-BEARING CENTERS — *The Ready Tool Co., 555 Iranistan Ave., Bridgeport 5, Conn.* Red-E standard ball-bearing centers, designed for use with high-speed steel cutting tools, are available in shank-, ball- and roller-bearing types. Accuracy is said to be held within 0.0002 in., with the point held to zero.



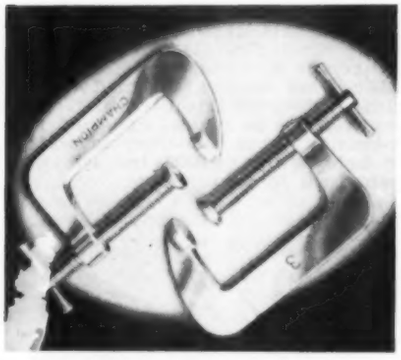
LIVE CENTER—*Sturdimatic Tool Co., 5216 Third Ave., Detroit 2, Mich.* Live center has a replaceable alloy-steel point ground true with the bearings. Low overhang and a slight cushioning action compensate for expansion. Thrust bearing takes all thrust load, and radial bearing takes only radial load. Standard shanks have Morse tapers.

PLUNGER CLAMP—*Detroit Stamping Co., Dept. K, 343 Midland Ave., Detroit 3, Mich.* "The Ram," an extra-heavy-duty plunger clamp, Model 640, is capable of exerting over 2500-lb. normal pressure. Handle is down when the clamp is closed. Clamp is adaptable to such conversions as light arbor, punch and forming presses.

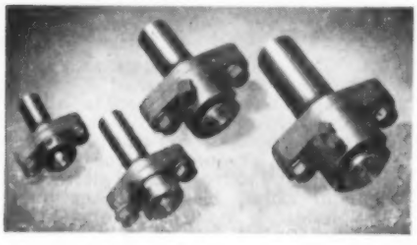


CLAMPING DEVICE—*The Jig-Nut Corp., 74½ Broad St., Newark 2, N. J.* Jig-Nut has been developed for use with work-holding fixtures or as part of conventional machine setups. Said to eliminate need for wrenches or tools in clamping work under strap clamps. Nut is screwed down finger tight exerting pressure by cam action.

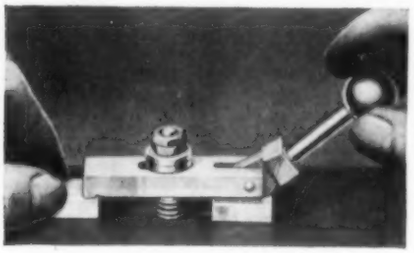
TOGGLE-ACTION CLAMP — *Knu-Vise, Inc., Detroit 16, Mich.* Unit can exert 1350 lb. at extreme end of toggle bar with man's normal pressure on handle. Base has integral front bracket and back support. The clamp (V-1100) is 14⅝ in. high, 9⅞ in. long, weighs 6 lb.



CLAMPS—*The Western Tool and Mfg. Co., Inc., Springfield, Ohio.* Champion aluminum "C" clamps are designed for high strength without sacrifice of lightness. Various sizes open from 2½ to 6 in. Depth from 1¾ to 2¾ in.

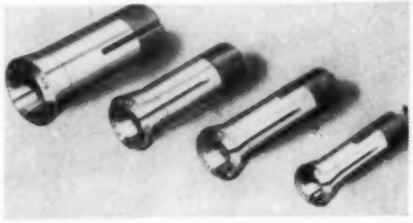


FLOATING-HOLDERS — *Barnaby Mfg. and Tool Co., 70 Knowlton St., Bridgeport 8, Conn.* A line of all-steel precision floating holders is available with shank diameters ⅝, ¾, 1 and 1¼ in.



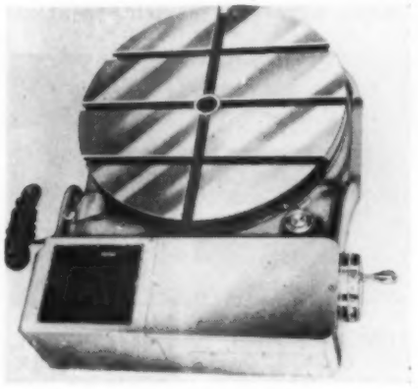
MIDGET FIXTURE CLAMPS—*West Point Mfg. Co., 19625 Merriman Court, Farmington, Mich.* Wespo Midget series consists of four styles, including quick-action clamps, for holding small work. Strap is 2½x⅝x⅜ in.

COLLET FIXTURE—*Zagar Tool Co., Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* A collet fixture, for use on standard plain grinding machines, grinds parts without centers. It is driven by headstock of machine and can be opened and closed while grinder is running. Maximum collet capacity is 2 in.



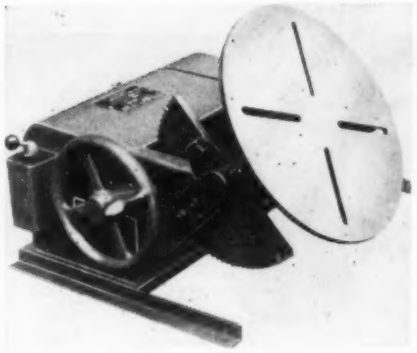
DRAW-IN COLLETS — *South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* A line of brass precision draw-in collets that can be rebored to larger diameters when used and machined to hold tapers or irregular shapes. Sizes are from 1/16 in. up to maximum capacity of collet.

COLLET HEAD—*Matco Tool Co., 2830 W. Lake St., Chicago 12, Ill.* Universal dividing collet head for grinding and milling has 24-tooth hardened and ground index plate. Standing 5¾ in. high, it takes to 1-in. capacity collet.

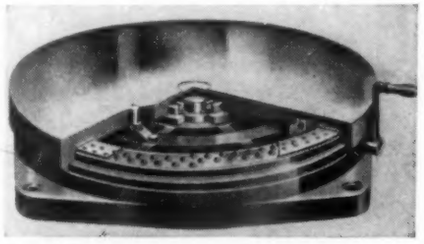


ROTARY TABLE—*W. B. Knight Machinery Co., 3920 W. Pine Blvd., St. Louis, Mo.* A power-feed, single-unit rotary table is designed to adapt any milling machine, shaper or horizontal boring mill for power rotary milling or precision indexing work. It has no power connection to the machine. There are 18 feed changes from 1½ to 54 ipm., and an optional range from 3 to 108 ipm. is available. The table has 20-in. dia.

INDEXING TABLE—*Kaukauna Machine Corp., Kaukauna, Wis.* The Model 700 indexing table supports heavy workpieces. Cast-iron bed has T-slots in top and at each end and work can be mounted either horizontally or vertically. A setup can be made at one end while work is being mounted at the other end. Indexing platen has a 36-in. dia., is manually operated.

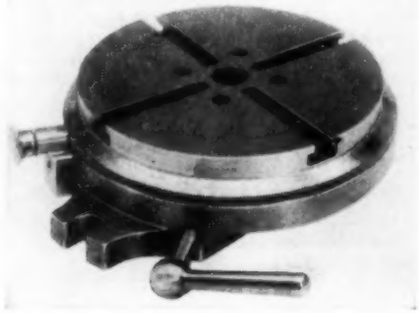


POSITIONER—*Industrial Div., Ransome Machinery Co., Dept. P-5, Dunellen, N. J.* A power-operated bench-model positioner is designed for 100 lb. work, or less. Work may be tilted to 135° and locked in position. It may be revolved 360° by a ⅛-hp. single-phase reversible motor from 0.21 to 5 rpm.

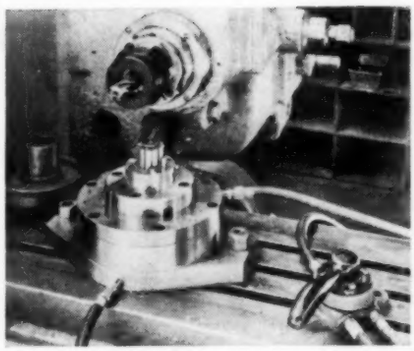


INDEX TABLE—*Robbins Engineering Co., 318 Midland Ave., Detroit 3, Mich.* Table indexes manually, locates automatically. Locations of index positions are determined by applications.

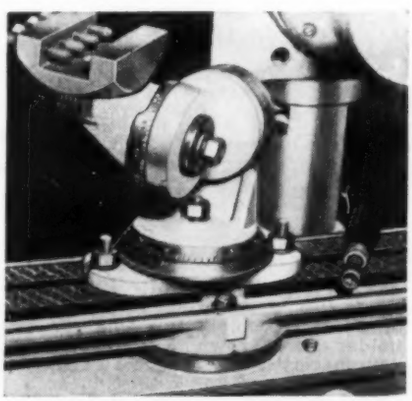
INDEXING TABLE — *Chicago Tool and Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* The Palmgren No. 83, an indexing table with 360° rotary movement and 4-in. cross-feed travel has 8-in. dia. and is graduated in single degrees.



ROTARY WORKTABLE—*H. P. Preis Engraving Machine Co., 157 Summit St., Newark 4, N. J.* A 5-in. dia. rotary worktable for engraving machines and small machine tools has outer rim marked in degrees and numbered every ten degrees.



FIXTURE—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Air-operated fixture incorporates Erickson precision face-plate mandrel. An addition to the precision chuck mounted on a milling machine, it is fitted with special locators for positioning work.

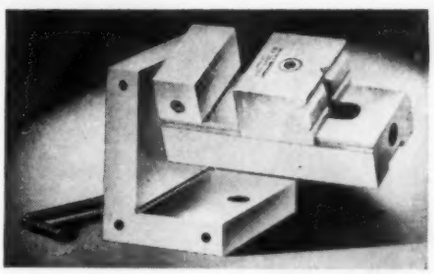


UNIVERSAL FIXTURE—*K. O. Lee Co., Aberdeen, S. D.* It holds all types of lathe tools for grinding. Four graduated quadrants permit fast, accurate setting of any simple or compound angle. It is designed primarily for carbide and high-speed tool grinding. Vise is 1½ in. (2-in. vise is available).

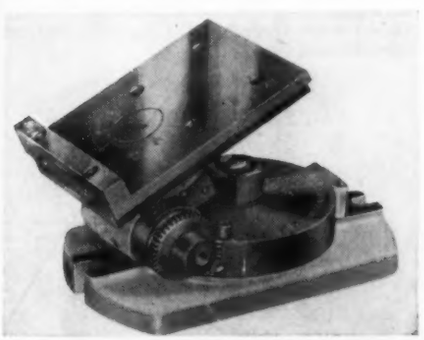
DRILL JIG—*McCullough Mfg. Co., 12709 Gratiot Ave., Detroit 5, Mich.* Drill jig will accommodate drills to ½-in. dia. A set of six bushings graduated from 1/16 to ⅜ in., inclusive, are furnished. For ½-in. holes the jig is used without bushings.

DRILL-JIG VISE—*Lift-Swing Fixture Corp., 237 South Ave., Garwood, N. J.* Unit holds pieces to be drilled, chamfered, tapped or counterbored. Top plate swings 180° to permit insertion of work.

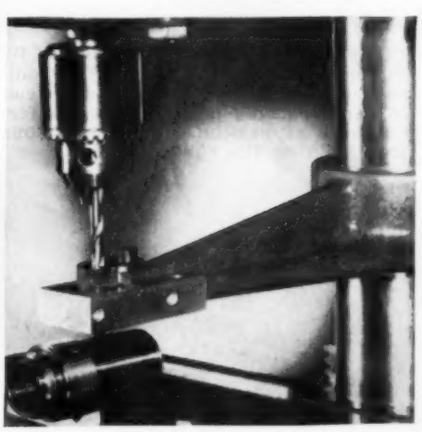
HOLE LOCATOR—*Knu-Vise, Inc., 2217 8th St., Detroit 16, Mich.* Hole locator operating like ordinary pliers has toggle action which automatically locks on the work, leaving operator's hands free. Several metal sheets can be aligned. Spindle takes 500-lb. work to 1¼ in. thick and uses pins in all popular diameters.



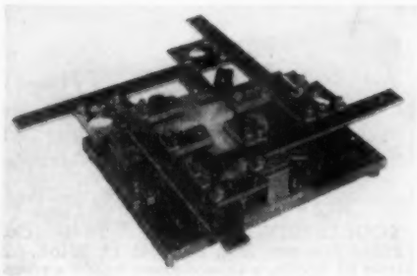
VISE AND ANGLE PLATE — *Star Gauge Co., distributed by Gale Forssen Co., 64 Monmouth St., Springfield 9, Mass.* A combination vise and angle plate is designed for such operations as layout work, drilling, tapping, light milling and grinding. The vise mounts at any angle, on end or either side and weighs 3½ lb.



ANGLE PLATE—*Matco Tool Co., Div. Machinists Tool Co., 2830-36 W. Lake St., Chicago 12, Ill.* Angle plate is a universal tool for drilling, grinding, gaging and tool-and-die work. The fixture is 3⅜ in. high and has a 3½x4½-in. angle plate.

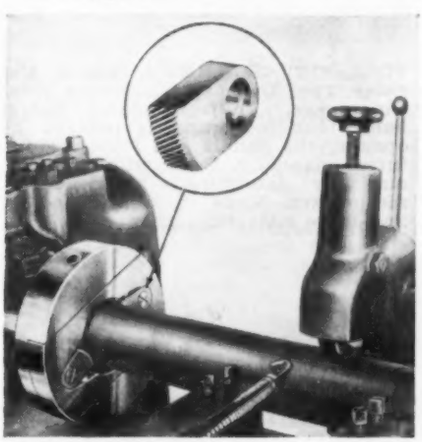


DRILLPRESS ADAPTER — *Aetna Mfg. Co., Oak Park, Ill.* An aluminum alloy casting to be attached to the column of small popular-make drillpresses has an eccentric aligning bushing in the adapter head which aligns spindle, column and adapter. It supplies bushing support to the drill or end mill in addition to the spindle chuck. Filler bushings cover a range to ½ in.

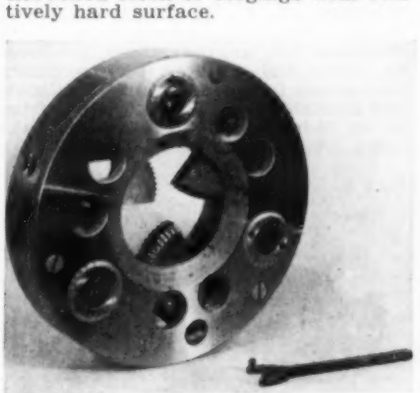


ADJUSTABLE JIG — *Superior Sales and Engineering Co., Cincinnati 2, Ohio.* This adjustable Speed-Jig setup is used for drilling five equi-spaced bolt-circle holes in a bearing-retainer plate. An infinite variety of patterns can be assembled. The Speed-Jig can be used for transferring hole locations, for layout work and as a master set-up for coordinating drill jigs.

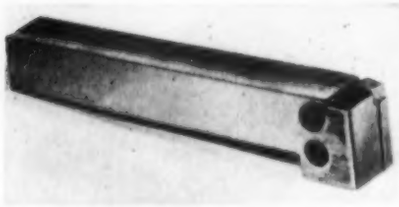
TOOL-GRINDING ARBORS — *Covel Mfg. Co., Benton Harbor, Mich.* A set of straight tool-grinding arbors, for use on any tool and cutter grinder, provides means of grinding cutters without changing footstock or tailstock positions. Arbors have a capacity for tools with 6-in. face width and 10-in. length.



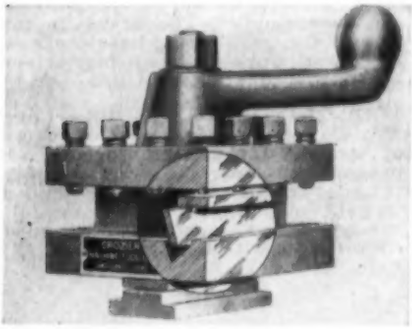
WORK DRIVER—*Seneca Falls Machine Co., Seneca Falls, N. Y.* Improved jaw design has been incorporated in the automatic work driver. Jaw teeth are now milled at a 25° angle, providing over-lapping contact for sure grip on smooth finish, or on hot-rolled stock or forgings with relatively hard surface.



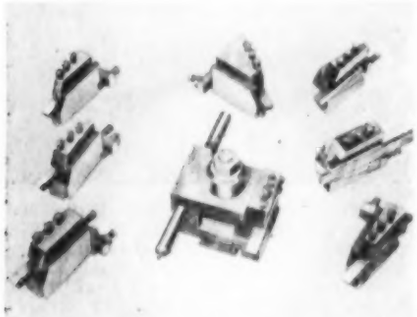
WORK DRIVER—*Gisholt Machine Co., Madison 3, Wis.* Automatic work driver grips and drives work that is supported on centers. Intended primarily for automatic lathes, it is used on engine or turret lathes or on grinders where a floating driver is required.



TOOLHOLDERS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* A line of holders in six sizes holds square solid-carbide inserts in a vertical position. By rotating the insert and then inverting it, a total of eight cutting edges can be presented before resharpening.



TOOLPOST TURRET — *Crozier Machine Tool Co., 684 N. Prairie Ave., Hawthorne, Calif.* Toolpost turret holds four tools and is indexed by opening the handle and revolving the turret manually. Pre-location is automatically determined by a detent mechanism. Made in small, medium and large sizes for lathes.



TOOLPOST—*A. K. Tool Co., 2029 Blake Ave., Los Angeles 26, Calif.* Toolpost for engine lathes produces an unlimited number of machining operations from one setup. Toolposts are available in sizes to fit lathes from 9- to 24-in. swing. Toolholders take tools from ¼ to 1¼ in.

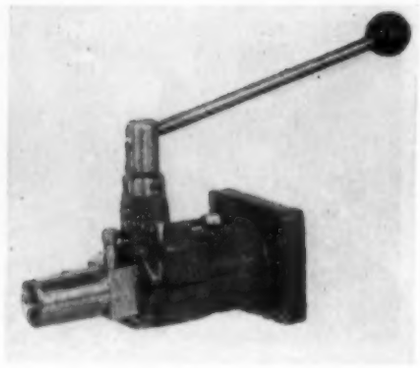
TOOLHOLDERS—*Econotool Co., Jenkintown, Pa.* "2-in-1" Econotools for turret lathes, engine lathes and small boring mills are toolholders made of alloy steel and have two clamp positions. If a cutting tip is ground after use and becomes too short for first clamping position, it can be held in next one.

CHUCK—*Royal Oak Tool and Machine Co., D-S Grinder Div., 621 East Fourth St., Royal Oak, Mich.* Chuck for holding tools of various sizes is used in place of machine collets.

TOOLHOLDERS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* A line of offset Ejector toolholders are said to have the advantages of the straight Ejector tools plus the ability to do hard-to-reach facing and boring operations.

TURRET—*Enco Mfg. Co., 4522-24 W. Fullerton Ave., Chicago 39, Ill.* Toolpost turrets have 12 stations spaced 30° apart. This permits three different working positions for each of four tools held on the square turret.

TOOLHOLDER—*Burg Tool Mfg. Co., 5028 W. Jefferson Blvd., Los Angeles 16, Cal.* A Neoprene-mounted, positive-drive, Tool-Flex toolholder, which will tap holes 15/16 in. center-to-center on multiple-spindle tapping operations, is composed of four parts; shank, collet, Neoprene mounting and locking ring. The floating mounting is used to compensate for misalignment and reduce tap breakage.

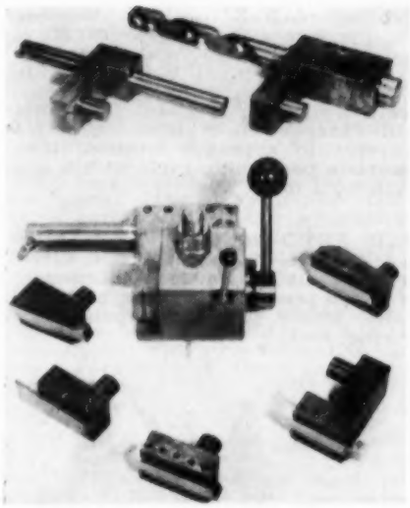


TURRET ATTACHMENT — *Sudbury Mfg. Co., Sudbury, Mass.* Five models have been added, two of them for use on engine-lathe tailstocks, with improvements in the sensitive turret attachment for use on lathes. It provides fingertip control of center drills, drills, reamers and other tools.

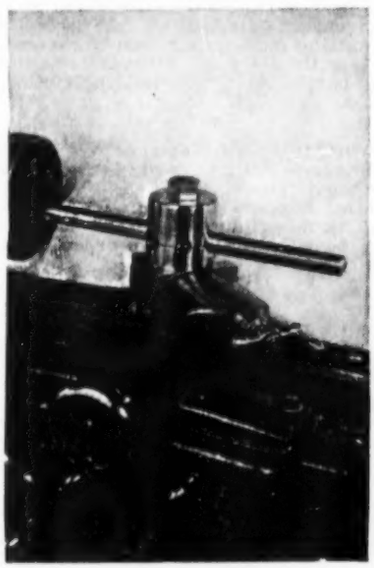
FLOATING HOLDER — *Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Adjustable floating holder for Brown & Sharpe "OO" Automatics has been redesigned, with heavier flanges and adjusting screws. Overhang has been reduced. Same collets are used as before. Range is from No. 80 (0.013-in.) to ¼-in. drill.

TOOLHOLDER—*Guarantee Tool Co., Inc., 96 Maple St., West Orange, N. J.* The Ideal threading toolholder is constructed so that the cutting tool retracts in a horizonal plane away from the work when pressure is too great for efficient cutting. It is claimed to reduce operating time by more than 40% when cutting a thread in a lathe.

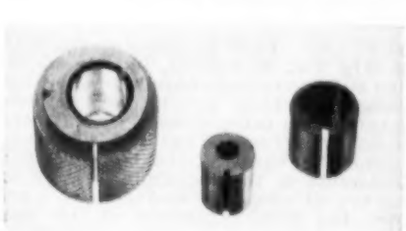
HOLDER—*George F. Bub and Son, 1143 Madison Ave., Cleveland 2, Ohio.* Master shank holder is fastened to machine tables, faceplates or larger plates. It holds: punch-, die- and toolholders; shanks, adapters and shanked tools. Bushing has 1¼-, 1½-, or 19/16-in. I.D. Over-all height is 3½ in.



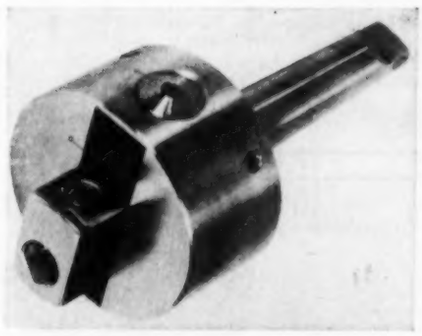
TOOLHOLDER—*Airo Products Co., 2709 W. 54th St., Los Angeles 43, Calif.* Fry Multi-Duty toolholder, for operations including drilling, reaming, tapping, turning, facing, threading, and cutting-off in one chucking, fits on compound of most engine lathes.



BORING SET—*Deloss Tool and Engineering Co., Royal Oak, Mich.* Triple boring set designed for Logan and Atlas lathes includes three boring bars of ¾x11, ⅝x9, and ½x8 in. Each bar has a ¼-in. square hole in each end.



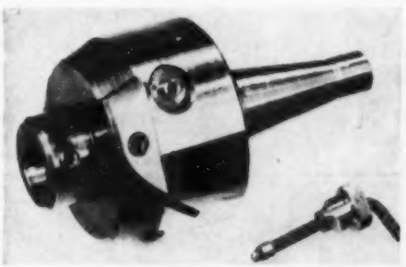
DRILL BUSHINGS—*Conex Products, Box 629, Glendale, Calif.* Drill bushing is furnished more than ¾ completed. Blank consists of a sleeve and insert. The sleeve is slotted to allow for slight expansion or contraction. Six sizes vary from maximums of 0.136 to 5 in.



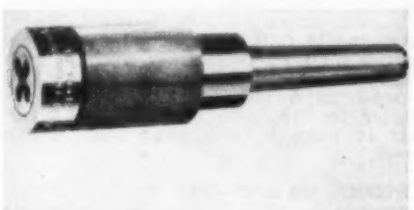
BORINGHEAD—*Flynn Mfg. Co., 433 Bates St., Detroit 26, Mich.* Redesigned No. 12 offset boringhead is now more compact, permitting extension of tool-recessed and hard-to-reach jobs. Wall of the tool grip has been increased ⅛ in. on each side. Length of tool grip has been increased ½ in.

MICRO DRILL CHUCK—*Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill.* Micro drill chuck is designed for two collet sizes: 0.005 to 0.025 in. and 0.020 to 0.0040 in. The chuck need not be adjusted when drill is changed.

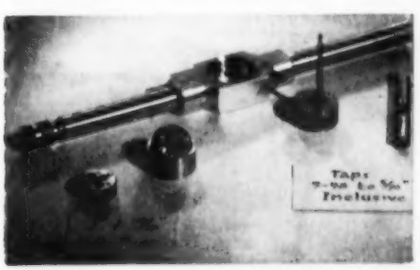
TURRET TOOLHOLDER — *Beekman Engineering Co., 1927 S.W. 1st Ave., Fort Lauderdale, Fla.* Self-indexing turret toolholder called Tripoint Turret is attached to any lathe for turning, boring, threading, facing and cutting-off operations. Twelve-position indexing gives three working positions for each tool.



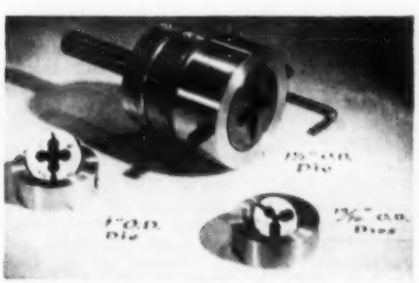
BORING HEADS—*Everede Tool Co., 2000 N. Parkside Ave., Chicago 39, Ill.* Offset boring heads are furnished with bushings to allow use of straight-type boring bars instead of conventional shank-type, jig-boring bars. No. 2-50 head has ½-in. dia. boring-bar capacity and bores max. hole of 2¼ in. No. 4-50 head has 1¼-in. dia. boring-bar capacity and bores max. hole of 6 in.



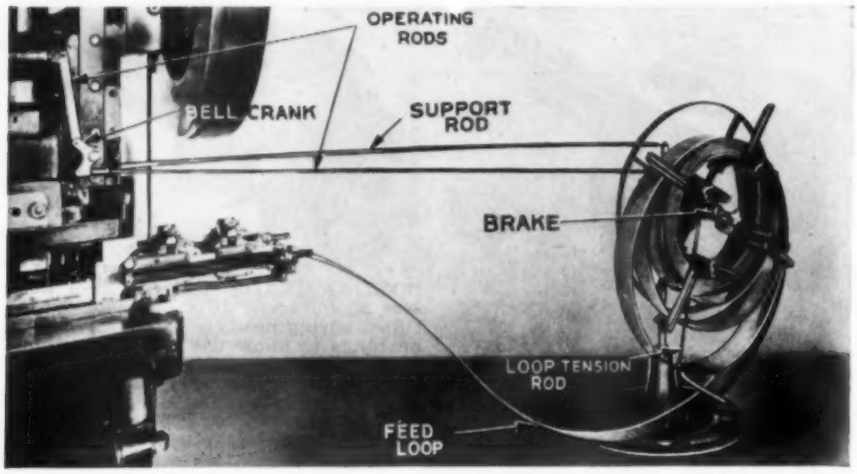
TAP AND DIE HOLDER—*Falls Products Inc., 120 Genoa St., Genoa, Ill.* A releasing tap and die holder designed for screw machines and ordinary engine lathes is made in three shank sizes. All sizes use a 1-in. button-type die for external threading or standard taps for tapping holes. The holder housing releases automatically at the conclusion of operation and backs off when rotation is reversed and turret is withdrawn.



TAP AND DIE HOLDER—*Beverly Blacksmith, 800 N. Grove St., Oak Park, Ill.* A combination tap and die holder is adjustable through the handle with a steel rod. An adapter is furnished. It will take a range of tap sizes from 3-4B to 5/16 in.



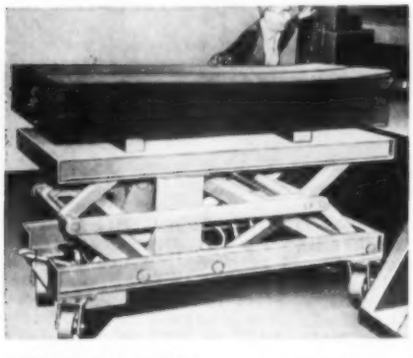
FLOATING DIE HOLDER—*Beverly Blacksmith, 800 N. Grove St., Oak Park, Ill.* Unit can be operated through any ½-in. capacity chuck in either a lathe tailstock or a drillpress. It can accommodate any 13/16-, 1-, or 1½-in. O.D. die.



STOCK REEL—*H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass.* Automatic unit is powered by punch press through bell crank and tie rod. Amount of unreeling is governed by loop-tension rod which causes pawl-lifter to lift pawl free of rack gear or to engage rack gear and rotate reel.

INDEX TABLE—*The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* Self-contained six-station hydraulic index table is used with Multipress or Multi-Unit press. Table can be used with any equipment where hydraulic power is available. Fluid motor is equipped with speed control, permitting 10 to 70 indexes per min.

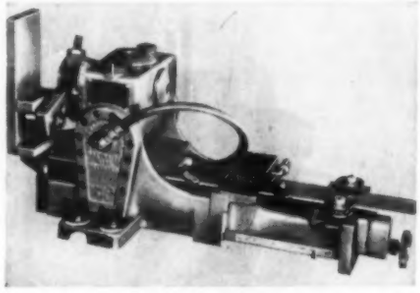
BAR FEED—*Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Hydraulic bar feed and collet chuck have a small ball-handled lever to control both feed and chuck mechanism. Speed of motion, length of stroke, is adjusted for individual jobs.



SHEET-FEEDING — *Lyon-Raymond Corp., 3690 Madison St., Greene, N. Y.* Table feeds sheet steel to presses and shears. Capacity is 10,000 lb., table top is 96x30 in., lowered height is 22 in. and elevated height is 34 in. Table loaded by fork truck or overhead means.

HYDRAULIC TABLE — *Lyon-Raymond Corp., 3469 Madison St., Greene, N. Y.* Table of tilting-type for feeding strip or sheet into inclined or horizontal presses. Capacity of the unit is 2000 lb. Table width is from 12 to 24 in., and lengths are to 96 in.

AUTOMATIC STOCK-FEED—*Racine Tool & Machine Co., 1760 State St., Racine, Wis.* Machine has 10x10-in. capacity, is a production-type unit. Operation is hydraulic.



STOCK-FEED — *Haller Machine & Mfg. Co., Inc., 7940 Tireman Ave., Detroit 4, Mich.* Hydraulically operated Model D-600 stock feed for use on most punch presses handles stock to 4-in. width and 3/32-in. thickness and feeds any length from 0 to 5 in. Accuracy of feed is said to be within 0.003 to 0.005 in. Is driven from press ram.

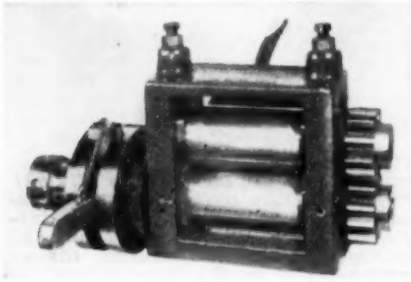
INDEX TABLES—*Buhr Machine Tool Co., Dept. K, 800 Green St., Ann Arbor, Mich.* Power index tables in seven diameters from 10 to 48 in., developed as components of production drilling machines, have been adapted for general production applications. Can be adapted to vertical or horizontal planes.

FEED TABLE—*Rack Engineering Co., Dept. B, 5102 Butler St., Pittsburgh 1, Pa.* Hydraulic feed table conveyor has a 1 to 5-ton capacity and can handle sheets 3 to 10 ft. long.

DIAL-FEED TABLE—*The A. K. Allen Co., 3011 Ft. Hamilton Pkwy., Brooklyn 18, N. Y.* An air-operated dial-feed table is applied to machines such as punch presses, drillpresses and millers. It has a 12-position, 7¼-in. dia. table. Air pressure from 30 to 50 psi. is used.

INDEX TABLE—*DeVlieg Machine Co., 450 Fair Ave., Ferndale 20, Mich.* Index table makes it possible to machine a casting on all four sides without rechucking or using outboard supports. Single pushbutton operation will cause slide to move by rapid traverse to approach location, then complete positioning cycle within less than 0.001 in.

BAR FEED—*Hy-Level Screw Products Co., 2114 W. Superior Ave., Cleveland 13, Ohio.* Bar-feed attachment of liquid-pressure type has a special valve which produces impulse only during feed.



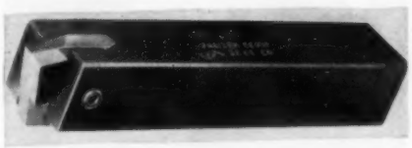
ROLL FEED—*Machine Service Co., 150 Croom St., Providence, R. I.* Friction roll feed feeds stock into stamping or cutting machines. It can be reversed in less than 1 min. without removing any parts and can be held as close as 1/3000 in.

HOPPER FEED—*Feedall Machine & Engineering Co., 70 Vine St., Willoughby, Ohio.* Model H-1000 automatic hopper feed handles 1⅛-in. dia. to 6-in. long cylindrical work. It can be attached to chute or magazine feed.

TABLE EXTENSION — *Lyon-Raymond Corp., 2987 Madison St., Greene, N. Y.* Removable table-top extensions for hydraulic elevating tables where strip and sheet feeding to presses is required. Extensions provide support for length of 72 in.

SPACING TABLE—*Beatty Machine & Mfg. Co., Hammond, Ind.* A simplified spacing table to handle I-beams for flange punching without any adjustment of the table is used with Beatty toggle punches. Handling is accomplished by carrying the beam on the underside of the top flange, which is always at die level and free to pass over the dies, regardless of the size of the I-beam.

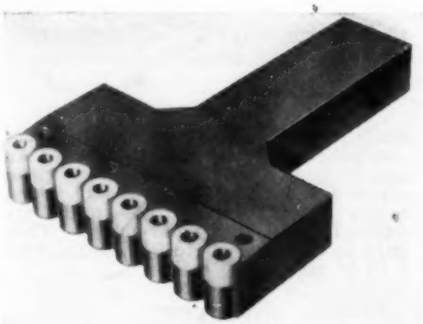
ROTARY STOCK STOPS—*Barnaby Mfg. & Tool Co., 70 Knowlton St., Bridgeport 8, Conn.* Stops for automatics and turret lathes are available in eight sizes from ⅝- to 2-in. shank dia., either with plain end or with center hole for bur.



TOOLS—*The O.K. Tool Co., Inc., Shelton, Conn.* Line of single-point tools takes carbide-tipped inserted toolbits. Tips have simple lock for quick change for turning, boring or facing.

LATHE TURNING — *Everede Tool Company, 2000 N. Parkside Ave., Chicago 39, Ill.* Tool uses triangular tool bits. Furnished in three sizes, left- and right-hand.

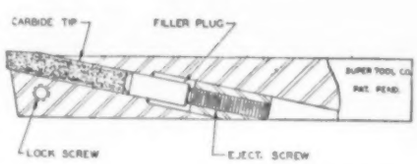
INTERNAL TOOLS — *Kennametal Inc,. Latrobe, Pa.* A line of internal radius tools and blanks used for rounding corners of machine parts. The tools (Style FR) and blanks (Style R) are for forming 12 sizes of corners from 3/32- to ½-in. radius.



ROLL-TURNER — *Kennametal, Inc., Latrobe, Pa.* Roughing roll-turner is used for production and redressing of chilled cast-iron rolls of any scleroscope hardness rating. Replaceable sharp-edged solid Kennametal cemented-carbide disks are secured to a heat-treated shank with counter-sunk capscrews, backed up by a hardened-steel plate.

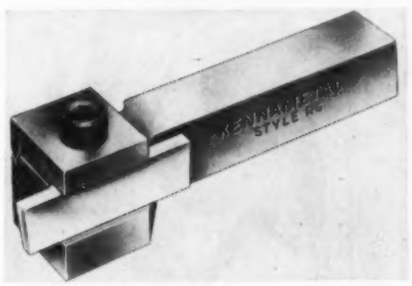
CARBIDE-TIPPED TOOL — *Wendt-Sonis Co., Hannibal, Mo.* Carbide-tipped tool for production grooving machines A, B, and C belt-size pulleys.

SAPPHIRE-TIPPED TOOLS — *Sapphire Products Div., Elgin National Watch Co., Elgin, Ill.* Four sapphire-tipped honing and burnishing tools are designed for use on lathe or drillpress for burnishing operations, counterbores and are from 0.200- to 0.700-in. dia. Both are water-cooled, one-end tools. The other tools are for hand burnishing and have double ends.



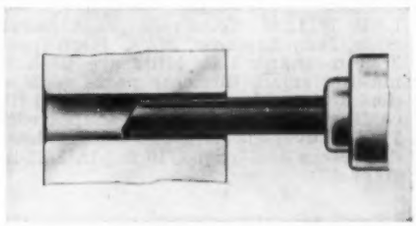
TOOLS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* Ejector-type tools wtih replaceable solid carbide bits are built in straight and offset types. Angle at which bit is ejected permits grinding with minimum of loss.

CARBIDE TOOLS—*Staples Tool Co., Cincinnati 25, Ohio.* Line of Carboloy turning, boring, facing and roller-turner tools, milling cutters, form tools, centers, and masonry drills supplements their line of circular cutting tools.



TOOLS—*Kennametal, Inc., Latrobe, Pa.* Two lines of tools with clamped-in Kennametal inserts. One line, Style RG (right-hand) and LG (left-hand) comprises an advanceable blade clamped in a heat-treated steel holder. The other line (illustrated) has a solid, round clamped-in insert supported by a back-up adjusting screw.

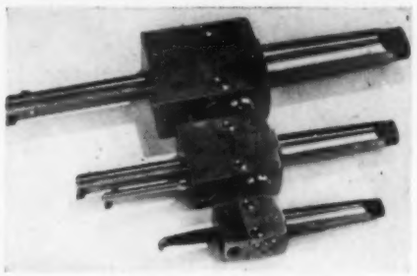
BORING BAR—*Melin Tool Co., 3370 W. 140th St., Cleveland, Ohio.* Micrometer adjustable boring bar is adaptable for boring long holes, holes that are hard to reach, or boring a casting with a larger inside than outside hole.



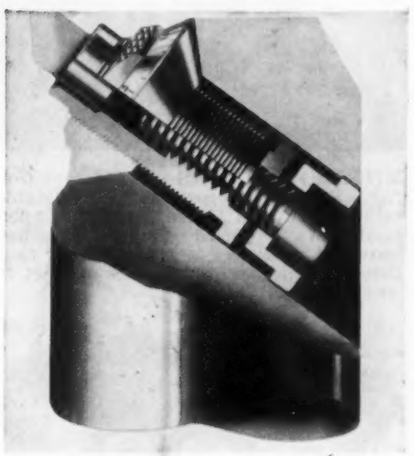
BORING BAR—*Carboloy Co., Inc., Detroit 32, Mich.* Solid-carbide boring bar has steel insert at one end of the bar in which the carbide boring tool is held and adjusted with setscrews. In seven sizes, the range of boring diameters is from ¼ to 1 in., and lengths are from 3½ to 11½ in.

BORING BARS—*Carboloy Co., Inc., Detroit 32, Mich.* Solid carbide bar has a carbide boring tool brazed into a recess at one end. Available in only one size: ¼- to ⅜-in. boring dia. and 3½ in. long.

BORING TOOL—*McKenzie Engineering Co., Newton, Conn.* Internal radius-boring tool can be made to fit the taper of a lathe tailstock, to be held between centers, or to fit in a turret lathe. Two sizes are illustrated with a few samples of parts that can be produced.



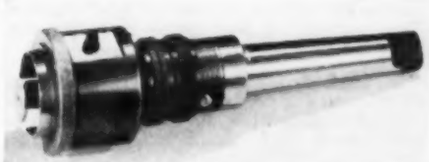
BORING HEADS—*The Maxwell Co., Bedford, Ohio.* A line of Mastur adjustable precision boring heads for work on boring, milling and drilling machines and automatics is made in three sizes, and can cut holes to 15-in. dia. Each tool has adjusting head graduated into 50 divisions.



MICROBORE TOOLS—*DeVlieg Machine Co., Ferndale 20, Mich.* Microbore too's can be adjusted in direct reading to 0.0001 in. on diameter for turning or boring.

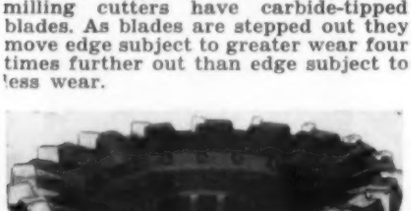
BORING TOOLS—*Carboloy Co., Inc., Box 237, Roosevelt Park Annex, Detroit 32, Mich.* Five styles of standardized carbide-tipped boring tools are announced. Styles 3 and 4 are round-shank tools for 30 and 45° boring bars and are made in four sizes each. Styles 5, 6 and 7 are square-shank tools for 30, 45 and 90° boring bars and are made in six sizes each.

BORING BARS—*Behr Products Co., Detroit 3, Mich.* Heavy-duty accessories are used in Behr bars for facing, boring, fly-tooling and other operations. Large hole adapter with split sleeve and extra-large hole adapter supplement present line.

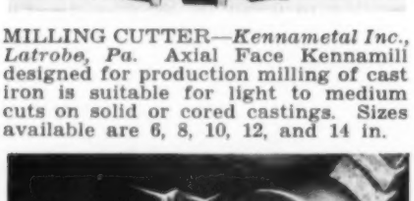


RECESSING TOOLS—*The Maxwell Co., 300 Broadway, Bedford, Ohio.* A line of precision recessing tools capable of back-facing, grooving and similar operations, are made in four sizes for holes. When the recessing tool is attached for operation, the pilot enters the work, and the cutter is fed a pre-determined amount by means of a rack-and-gear mechanism.

MILLING CUTTERS—*O. K. Tool Co., Inc., Shelton, Conn.* Dual-adjustable milling cutters have carbide-tipped blades. As blades are stepped out they move edge subject to greater wear four times further out than edge subject to less wear.



MILLING CUTTER—*Kennametal Inc., Latrobe, Pa.* Axial Face Kennamill designed for production milling of cast iron is suitable for light to medium cuts on solid or cored castings. Sizes available are 6, 8, 10, 12, and 14 in.



MICRO-MILLS — *Severance Tool Industries, Inc., Saginaw, Mich.* Carbide Micro-Mills for precision internal finishing of holes are said to remove material up to Rockwell 63-C faster than grinding and with comparable finish.

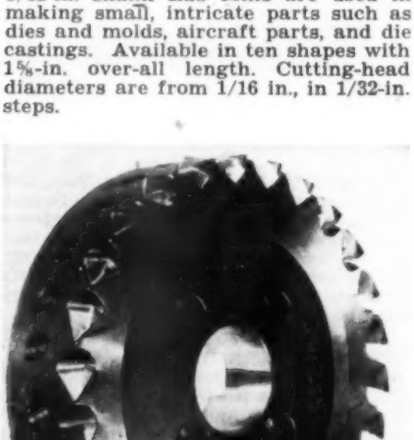
CARBIDE MILLING CUTTERS—*H. T. Howard Machine Works, 182 Sigourney St., Brooklyn 31, N. Y.* Replaceable-blade end mills are suited for small milling jobs, and are made from 1½- to 3-in. dia. with 4 to 6 blades. Shell mills for light or heavy duty range from 3- to 6-in. dia. with 6 to 12 blades. Face mills for heavy duty are 8⅜-in. to 14-in. dia. with 10 to 20 blades. "Sharp-Blade Lock" on shell and face mills and "Cone-Blade Lock" on replaceable-blade end mills provide a means for replacing and making blade adjustments for setting and grinding.

FACE MILLS—*Weddell Tools, Inc., 37 Centennial Street, Rochester 11, N. Y.* Tri-Bit face mill with carbide tips is for high-production milling of frail castings. In two types for roughing and finishing.

SHELL END MILLS—*Vascoloy-Ramet Corp., North Chicago, Ill.* Two lines of shell end mills, Red Streak carbide-tipped and Blue Streak Tantung-tipped, are made in right- and left-hand styles. Sizes range from 2½- to 4½-in. O.D. with bores from 1 to 1½ in.

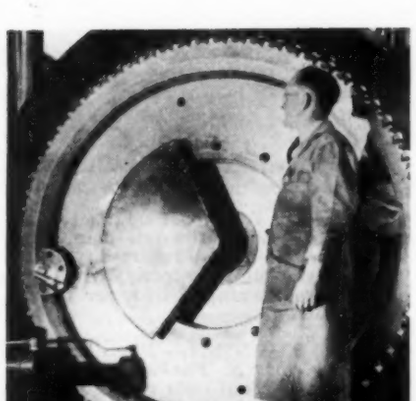
MILLING CUTTERS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* The Bi-Axial carbide-tipped milling cutter is used for slotting steel too difficult for ordinary tungsten-carbide cutters because of flutter. Design provides automatic centering.

LAB MILLS—*Severance Tool Industries, Inc., Saginaw, Mich.* High-speed 3/32-in. shank Lab Mills are used in making small, intricate parts such as dies and molds, aircraft parts, and die castings. Available in ten shapes with 1⅝-in. over-all length. Cutting-head diameters are from 1/16 in., in 1/32-in. steps.

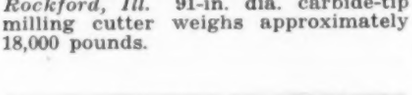


FACE MILLS—*Weddell Tools, Inc., 37 Centennial St., Rochester 11, N. Y.* Super Tri-Bit face mills are designed for production work on frail malleable or alloyed castings such as cylinder blocks and pump casings. Teeth are closely spaced so that feed rate can be fast.

ROTARY FILES, BURS — *Nicholson File Co., Providence, R. I.* Rotary files and ground burs are made with ⅛-in. shanks in nine standard styles or shapes with head sizes from ⅛- to ⅝-in. dia. 18 hand-cut rotary files or 18 ground burs are available.



CUTTER—*Ingersoll Milling Machine Co., Douglas St. and Willoughby Ave., Rockford, Ill.* 91-in. dia. carbide-tip milling cutter weighs approximately 18,000 pounds.



END MILLS—*Helical Cutter Co., 15536 Telegraph Rd., Detroit 23, Mich.* An end mill with a progressive spiral taper is said to shear evenly along entire cutting edge. The mills are 4-fluted with right-hand flutes. They vary in size from 1- to 6-in. flutes with 1 to 3° taper.

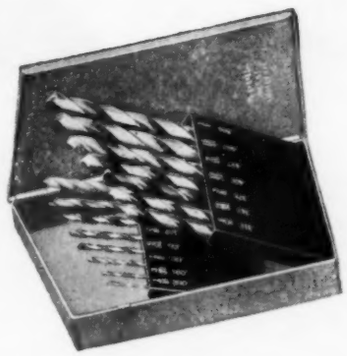
BI-AXIAL GRIND—*Super Tool Co., 2165 Hoover Rd., Detroit 5, Mich.* Grind makes heavy side- and face-milling cuts with solid-carbide-insert blade cutters. Combination of negative radial and two negative axial rake angles have a centering effect on cutter said to stabilize pressure and eliminate flutter.

CARBIDE BURS—*The Atrax Co., 240 Day St., Newington 11, Conn.* Made in ¼-in. size on ⅛-in. steel shanks, they are used in high-speed tools, and come in set of nine shapes. Helix, rake, depth of flute, fillet and finish are all controlled by precision grinding with coolant.

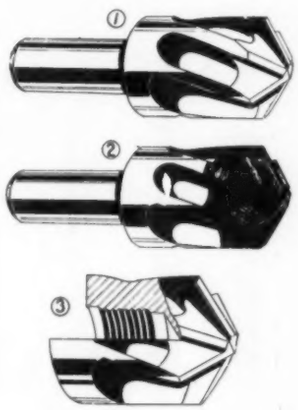
CARBIDE BURS—*M. A. Ford Mfg. Co., Inc., 780 W. 1st St., Davenport, Iowa.* Burs for internal grinding, jig grinding, and blending and finishing by off-hand grinding. Made in standard sizes for 1/16- to ¾-in. tool dia.

CARBIDE BURS—*Lincoln Park Industries, Inc., 1719 Ferris Ave., Lincoln Park 25, Mich.* Two sets of Carburs in plastic cases are announced. One is comprised of seven different tools of ¼-in. head dia. with shanks of ¼-in. dia. and 1¾ in. long. Other combines the seven ¼-in. dia. tools with standard set of 11 Midget Carburs. They are used to replace steel rotary files, small mounted grinding wheels.

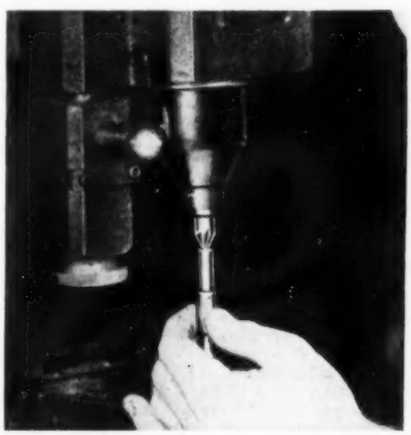
REAMERS — *Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* Standard carbide-tipped reamers with tips running full length of flutes are in 32 sizes from ¼ to 1½ in. Long tips serve as wearing guides, preventing the reamer from freezing up due to galling.



DRILL CASE—*Huot Mfg. Co., 128 E. 10th St., St. Paul, Minn.* A metal case for drills from 1/16 to ½ in. is graduated on basis of 1/32 in. Other cases are graduated 1/64 in.

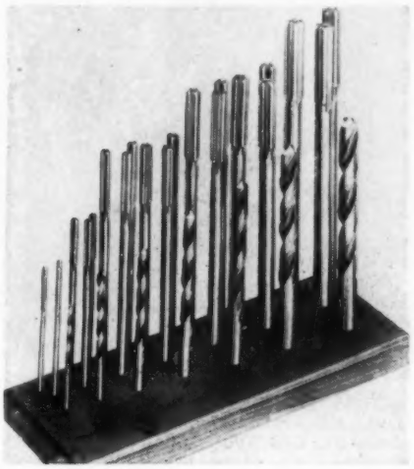


COUNTERSINKS—*Severance Tool Industries, Inc., 726 Iowa Ave., Saginaw, Mich.* Three additions have been made to the line of chatterless countersinks. Chatterless countersinks having a 60° angle with the center line are now standard in nine sizes to 1-in. dia., are made in cemented carbide in sizes to 1½-in. dia., countersinks with threaded bodies have been added in sizes of 1-in. dia. and larger.



LAPPING TOOL—*Raymac Mfg. Co., Inc., 3729 Cass Ave., Detroit 1, Mich.* Solid - carbide center - lapping tool, available in standard sizes of ½x1½ in. and ⅜x1½ in., 60° included angle. Can be used in working metal up to 62 to 65 C Rockwell.

COUNTERBORE—*Mohawk Tool Co., 21653 Dequindre Rd., Hazel Park, Mich.* High-speed steel "lifetime" counterbore with a pre-ground sub-land pilot has blades which are said to be approximately five times as long as on most counterbores. The radial-ground sub-land pilot extending the entire length of the tool provides unusually long life. Tools are available in fillister screw sizes to 1 in.



REAMERS—*Twentieth Century Mfg. Co., 3726 Montrose Ave., Chicago 18, Ill.* Decimal-sized Superream reamers from 0.0461 to 0.0501 have diameters held to plus 0.0002 and minus 0.000, and size markings stamped half-way up the shanks.

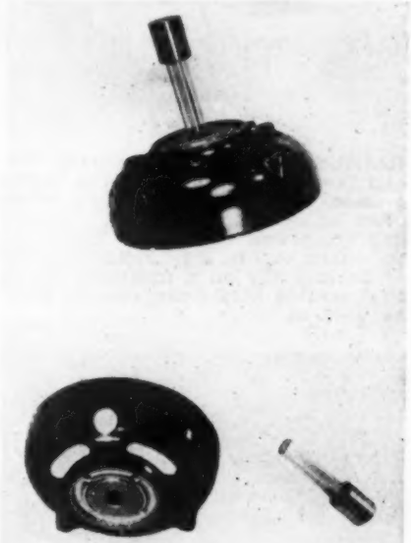
MASONRY DRILLS—*Vascoloy-Ramet Corp., North Chicago, Ill.* A line of Red Streak carbide-tipped masonry drills is available in offset and straight shank designs in drill diameters of 0.198 to 1.535.

CUTTERS—*Cadillac Cutter Co., 1613 Eastern Ave., S. E. Grand Rapids 7, Mich.* A line of high-speed steel tapered-spiral cutters ranges from ½ to 7° taper per side, ½- to 3½-in. flutes, and small-end dia. from 3/32 to ½ in.

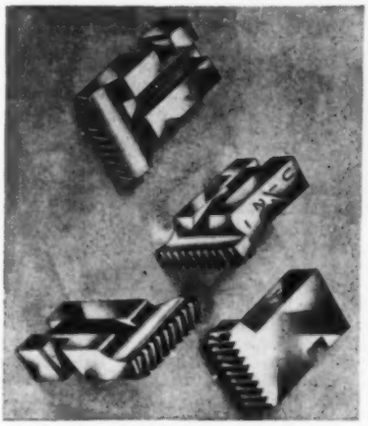
MASONRY DRILLS—*New England Carbide Tool Co., Cambridge, Mass.* Carbide-tipped Cyclone drills for masonry work have deeper flutes permitting cuttings or powder residue to escape more freely.

SQUARES—*Kennametal, Inc., Latrobe, Pa.* Solid Kennametal squares, Grade K5H, style SS, are bottom-side diamond ground with a 10° formed angle at one end. They are for precision boring of cast iron, steel, and nonferrous metals. Sizes include ¼x¼x1¼ in., 5/16x5/16x1½ in., and ⅜x⅜x1-1/3 in.

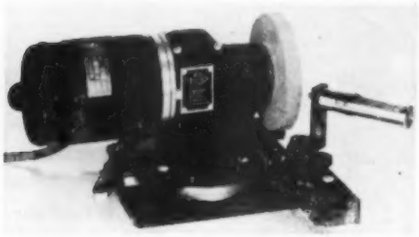
CENTER DRILL—*Reltool Corp., 712 W. Michigan, Milwaukee, Wis.* Spiral center drill and countersink reduces frequency of regrinding. A large flute gives easy chip clearance. Spiral incorporates the Reltool "shockless" feature: a fillet at point where 60° countersink angle meets tip.



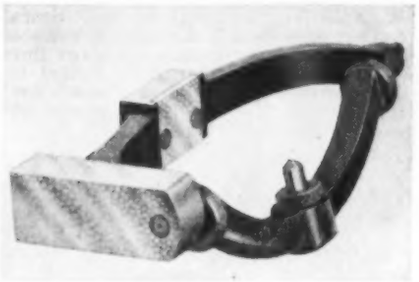
SAPPHIRE TOOL—*Sapphire Products Div., Elgin National Watch Co., Aurora, Ill.* Sapphire burnish-sizing tool brings powdered-metal and other soft bearings back to shape and size after staking operations. Available in sizes 0.125 to 0.700 in dia.



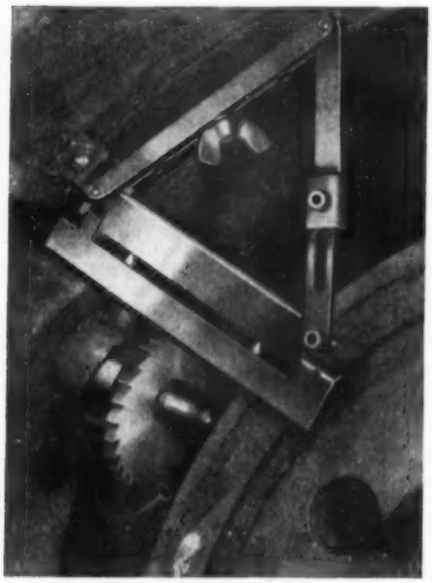
THREAD CHASERS—*Geometric Tool Company, New Haven, Conn.* Line of Supermetric ground thread chasers has all threads and other surfaces ground to high finish. Available in all National Standard thread sizes for the 5/16-in. style DS and DJ dieheads in regular and projection types.



WHEEL DRESSER—*Eastern Machine Tool Co., East Hartford, Conn.* Machine, for dressing and shaping diamond wheels, removes dull diamond particles and bonding materials from face of wheel, leaving true face with new particles exposed.



RADIUS DRESSER—*Universal Vise and Tool Co., Parma, Mich.* The radius dresser, designed for grinding wheel dressing, produces convex, concave and compound radii from 0 to 1 in. on wheels to 7-in. dia. Held vertically or horizontally on a magnetic chuck, it is said to hold tolerances as small as 0.001 in.



WHEEL DRESSER — *Diamond-Detroit, Inc., Detroit, Mich.* The Diamond-Miser, a device designed to provide uniform wheel dressing, is said to hold the diamond tool against the wheel in such a way as to give uniform rotation to the diamond and cause a new face to be presented to the wheel with each pass.

WHEEL DRESSER—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Tru-Matic wheel dresser for use in repetitive precision production does not have to be removed from machine. Movement of locking lever permits the diamond to be turned back out of the way.

DRESSING NIB—*The National Diamond Hone & Wheel Co., 108 Fulton St., New York 7, N. Y.* By using a special sintered alloy bond, a cluster-wheel dressing nib that is claimed not to dull the abrasive grains of the grinding wheel by abrasion with a hard bond is available. Diamonds are interspersed throughout binder.

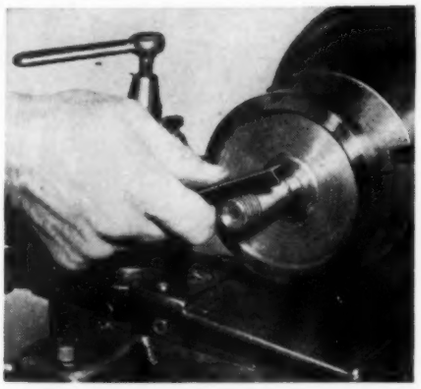
FORM DRESSER—*Matco Tool Co., Div. Machinists Tool Co., 2830-36 W. Lake St., Chicago 12, Ill.* Form dresser designed to dress precision radii on grinding wheels handles any form of radius dressing, concave or convex, up to 1 in. circle, and dresses up to 10-in. O.D. wheels.

WHEEL DRESSER—*Matco Tool Co., 2834 W. Lake St., Chicago 12, Ill.* Radius and angle wheel dresser can form convex or concave radii with only two angles tangent in one continuous motion without stopping.

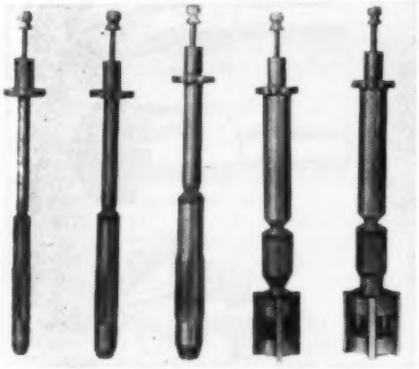
CUT-OFF WHEEL—*American Emery Wheel Works, Richmond Sq., Providence 1, R. I.* Ripper abrasive cut-off wheel designed on ripsaw principles with radial depressions. Minimum thickness is 1/16 in. in the 6-in. size and 3/32 in. in 8-, 10-, and 12-in. sizes.

GRINDING WHEEL—*Chicago Wheel and Manufacturing Co., 1101 W. Monroe St., Chicago 7, Ill.* Metallic-sheathed grinding wheel, known as Silver Streak, has basic improvements in the vitrified or ceramic bond in addition to the metallic sheathing.

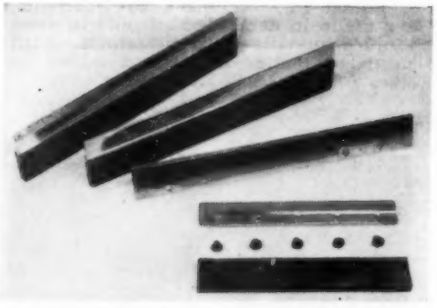
GRINDING WHEEL—*Carborundum Co., Niagara Falls, N. Y.* Grinding wheel, Series 20, is a ceramic- or vitrified-bonded grinding wheel in which a new type of abrasive grain is used.



ABRASIVE STICKS—*Sandusky Abrasive Wheel Co., 687 W. Ransom St., Kalamazoo, Mich.* Flexible abrasive sticks made of abrasive grains bonded in rubber are used for jobs such as grinding, cleaning, deburring, honing and polishing. Sticks can be cut to fit shape of work. Available in fine, medium and coarse grades.

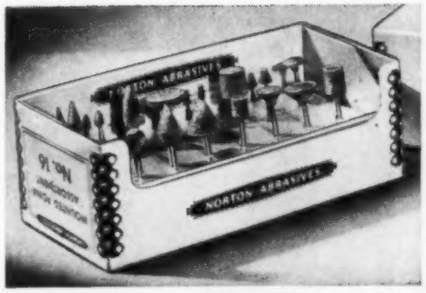


TOOLS—*Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Five Micro-mold utility tools cover a range of bores from 1- to 4-in. dia. Abrasive sticks of graduated heights are encased in plastic.

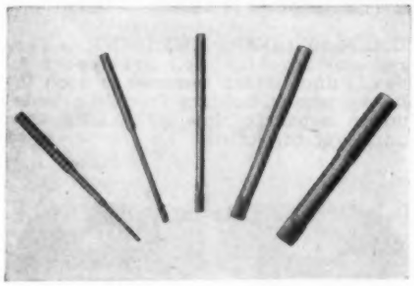


CENTERLESS-GRINDER BLADES—*The Foulk Mfg. Co., 4208 Airport Rd., Cincinnati 26, Ohio.* A line of Ampco Bronze centerless-grinder blades is recommended for use when grinding materials "pick up" or score easily. Quick-change insert-type construction permits use of many inserts with one or two blade bodies.

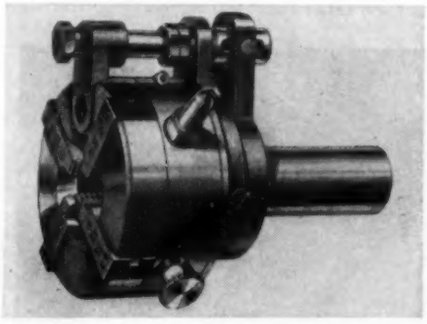
CENTERLESS-GRINDER BLADE—*The Cliff Co., 17 N. Leclaire Ave., Chicago 44, Ill.* Clifco blade features sectional inserts of tungsten carbide at the wearing surface. The inserts are separated by thin strips of specially developed alloy and laid in a slot with supporting walls of steel. Walls permit use of a harder carbide (grade CA-4 Carmet). Construction makes it possible to lay the carbide four times as deep as on conventional blades.



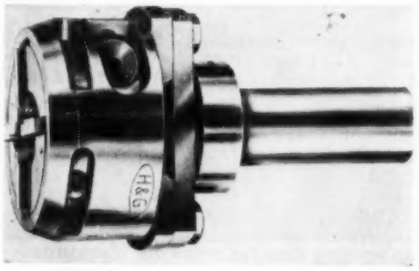
MOUNTED POINTS — *Norton Co., Worcester, Mass.* Made up into a kit of 16 popular sizes and shapes and known as No. 16 Assortment, the points are made of 38 Alundum abrasive, vitrified bonded and strongly cemented on steel spindles.



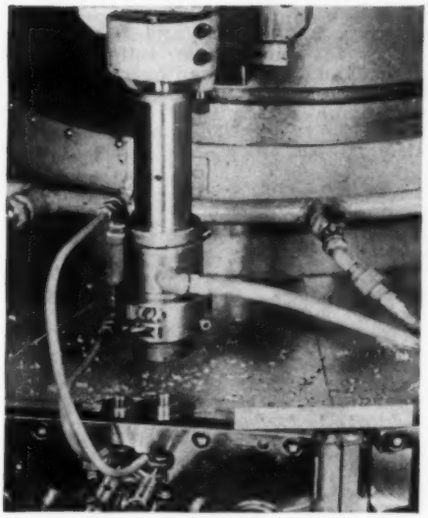
CARBIDE GRINDING WHEELS— *Raymac Co., 3729 Cass Ave., Detroit, Mich.* Solid tungsten-carbide grinding wheels are in standard sizes from 0.030 to 0.250 in. and in special sizes. Wheels can be sharpened several times with little change in the diameter or shape.



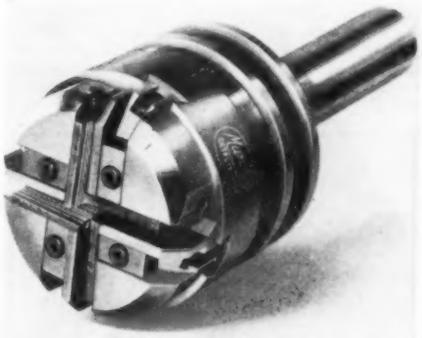
DIEHEADS — *Geometric Tool Company, New Haven 15, Conn.* Line of convertible self-opening dieheads, the improved style DS, is intended for light hand screw machines and automatics where the diehead does not rotate. Heads are built in six sizes with a cutting range from 1/16 to 1¾ in.



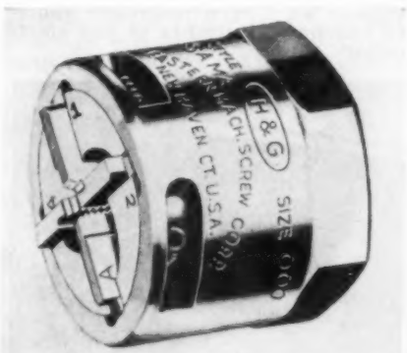
DIEHEAD—*Eastern Machine Screw Corp., Truman and Barclay Sts., New Haven 6, Conn.* Short compact diehead, H & G Style SMM, for chucking machines such as Goss & DeLeeuw, has capacity for a wide range of thread sizes.



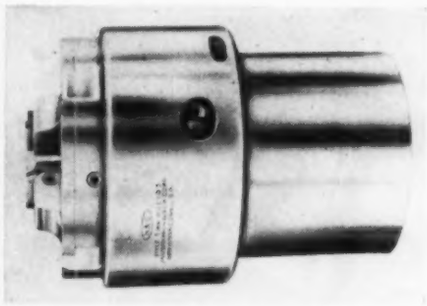
DIEHEAD—*Eastern Machine Screw Corp., Truman and Barclay Sts., New Haven 6, Conn.* Unit works in restricted area, is shown working on mixing valve common on washing machines. Valve has ¾-in. straight pipe threads, but the two threads are so close together that it is impossible to surround them with an ordinary threading die.



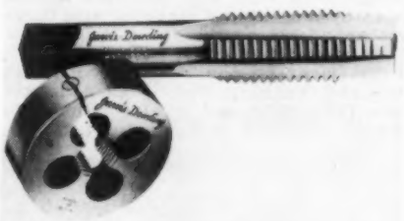
DIEHEADS—*Murchey Machine and Tool Co., 951 Porter St., Detroit 26, Mich.* Tangent-chaser dieheads are furnished in stationary and revolving types. Interchangeable chasers and chaser-holding blocks can be removed and replaced without removing the tool from the machine.



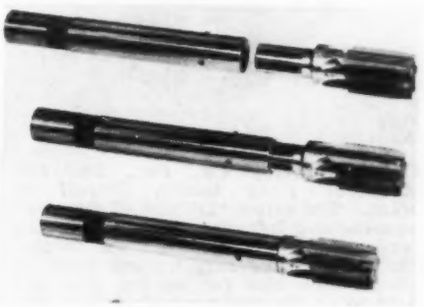
DIEHEAD—*The Eastern Machine Screw Corp., Truman & Barclay Sts., New Haven 6, Conn.* 000-size style Sama adjustable insert-chaser diehead is applicable to small screw and tapping machines. Capacity is ¼-in. dia. in pitches from 20 to 80. The head is designed for a No. 1 size holder with a ¾ in.-24 thread.



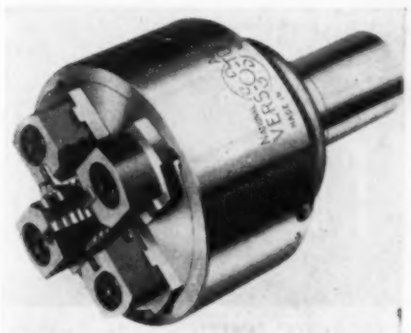
DIEHEADS—*Eastern Machine Screw Corp., Truman and Barclay Sts., New Haven 6, Conn.* H & G aligning dieheads, style SAML, are solid adjustable type. Shank acts as self-contained toolholder with adjustment for misalignment to 0.025 in.



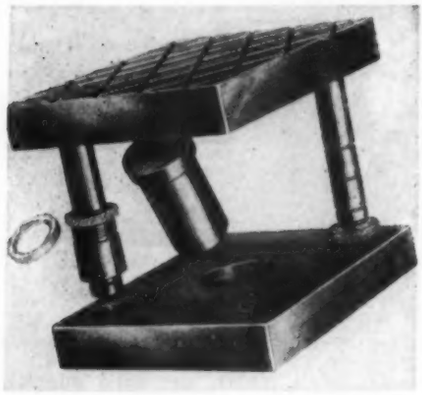
TAPS AND DIES—*Charles L. Jarvis Co., Middletown, Conn.* Line of the Dowding Div. of Henry L. Hanson Co. has been purchased by Jarvis and is now distributed on a nation-wide basis.



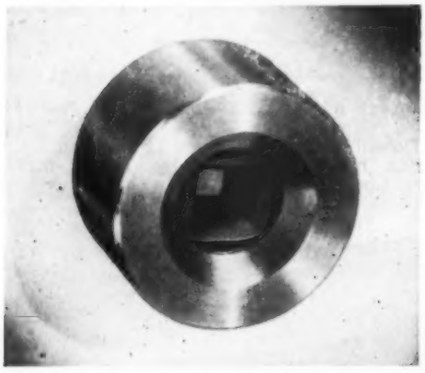
TAPS—*Detroit Tap and Tool Co., 8432 Butler, Detroit 11, Mich.* Nib-type M-11 taps coupled to hollow shanks are 30%-lighter. They are useful in applications where fairly long tap shanks are used. Several parts are tapped at a time, and tapped parts load up on the shank.



VERS-O-TOOLS—*National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* Adjustable blade chasers are used in standard circular chaser Vers-O-Tool heads. Chasers are moved ahead after each grind so that cutting edges are always up to proper cutting position.



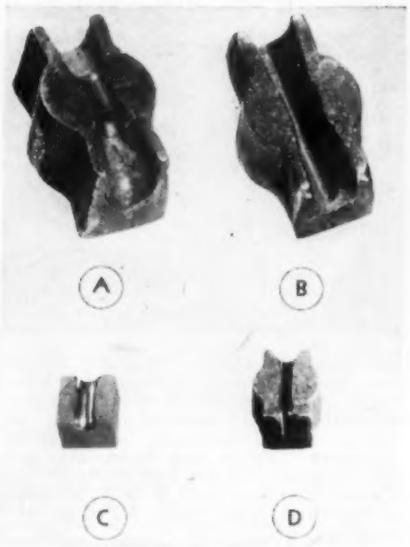
DIESETS—*A. W. Grunow Co., 563 White St., Orange, N. J.* Dieset has tapered guide-post bushings that can be made to turn and contract or expand by loosening a lockring and turning an adjustment ring. Design provides means to compensate for lateral-thrust wear on the bushing. Ring is loosened, bushing slightly turned, and lock ring tightened again. Bushings can be replaced in few minutes.



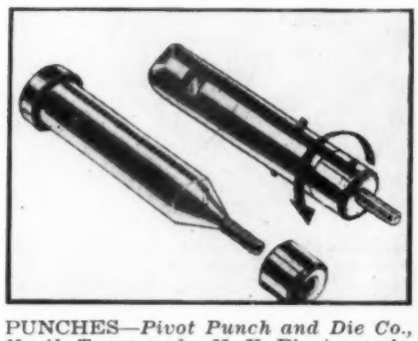
DIES—*Carboloy Co., Inc., Box 237, Roosevelt Park Annex, Detroit 32, Mich.* The series "D" line of standard square- and hexagonal-shape dies has larger bell openings than the former "R" line. Dies range from 5/32- to 1⅝-in. hole size for square dies and 5/32 to 1⅞ in. for hexagonal dies. Enlarged opening permits stock to enter the die carrying heavier coating of lubricant.

PUNCHING UNITS — *Wales-Strippit Corp., 345 Payne Ave., N. Tonawanda, N. Y.* Heavy duty Wales Type "CJ" hole-punching units are designed to punch mild steel to ¼ in. thick. Each unit consists of holder that carries punch, die and stripping mechanism. Available in three holder widths with a max. punch dia. of ⅞ in.

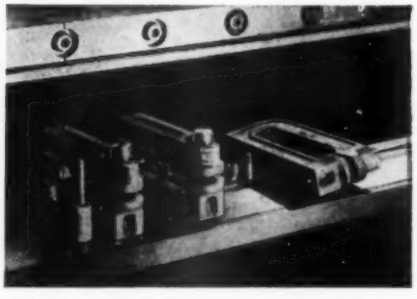
PUNCH AND DIE UNITS—*Raar Mfg. Co., 1663 N. Highland, Los Angeles 28, Calif.* Interchangeable self-stripping punch and die units can operate in the smallest press equipment and have a shut height of 3¼ in. With hole sizes from 1/32 to 1-1/32 in., the units have air slug ejection.



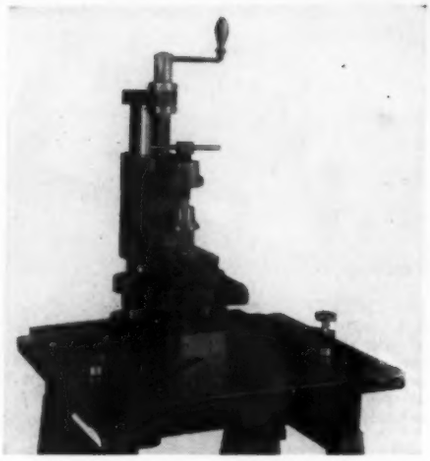
WIRE-STRAIGHTENING DIES — *Adamas Carbide Corp., 1819 Broadway, New York 23, N. Y.* Carbide wire-straightening dies are said to provide a life of over 300 days as compared to a 2-day average life of the other dies.



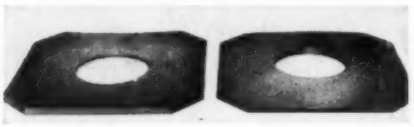
PUNCHES—*Pivot Punch and Die Co., North Tonawanda, N. Y.* Pivot punches are designed so that punch diameter can be one-half material thickness and yet retain accuracy. They are available as ¼-turn removable shoulder punches or punches of any specification.



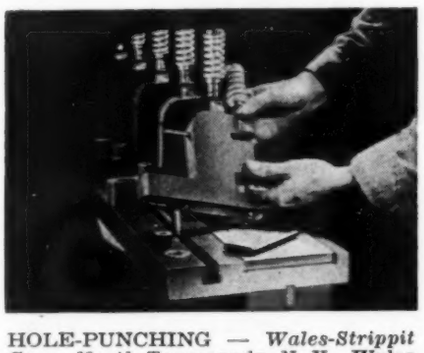
HOLE-PUNCHING UNITS — *Wales-Strippit Corp., North Tonawanda, N. Y.* Wales hole-punching and notching units are now mounted in press brakes by "Strip" templets. Templet fits into a press-brake rail equipped with T-slot. Rail remains in the press brake when setups are changed, and templets are simply lifted out of the rail.



PUNCH-HOLDER REMOVER — *The Producto Machine Co., Bridgeport 1, Conn.* Punchholder remover is used to remove punch holders from die beds and to separate dies by taking the punch out of the die.



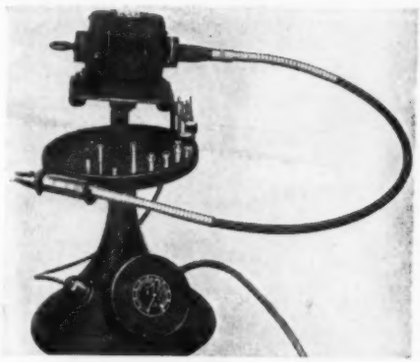
DI-ALI-NERS—*Lempco Products, Inc., Bedford, Ohio.* Di-Ali-Ners compensate for misalignment for punch-press equipment. They consist of a pair of semi-elliptical plates, one concave and the other convex, both with flat exteriors. Plates are installed with curved surfaces facing each other.



HOLE-PUNCHING — *Wales-Strippit Corp., North Tonawanda, N. Y.* Wales heavy-duty Type EJ hole-punching unit with center projection to carry die, is used in series to punch holes simultaneously in angles, channels and extruded shapes. Center projection can be located to punch these various extruded sections.

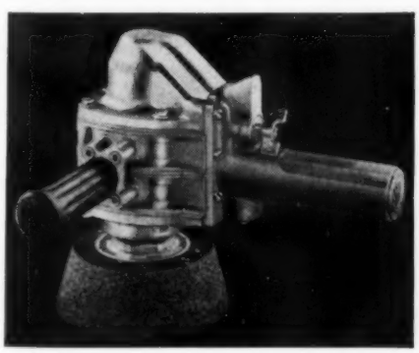
DIESETS — *Standard Machinery Co., 1565 Elmwood Ave., Providence 7, R. I.* All-steel diesets are offered in a complete range of sizes, and can be supplied for all presses. Die shoes, punch holders, pins and bushings are interchangeable from stock without rework or fitting.

EMBOSSING DIES—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Embossing dies for working aluminum- or magnesium-alloy strips are designed so that the embossed work will have flat faces for the application of color enamel. This is done by finishing the sunk, engraved letters and design of the female die to accomplish a flattening or coining result when the dies are pressed together.

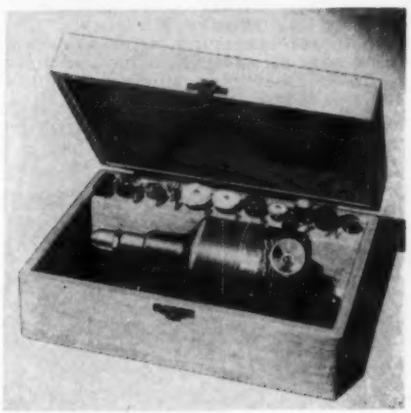


GRINDER—*R. G. Haskins Co., 2651 W. Harrison St., Chicago 12, Ill.* Model VB2 high-speed grinder in pedestal and bench-mounted types has ¼-hp. motor that delivers 18,000-rpm. free speed. Special spindle handles all mounted points and wheels with ¼- or ⅛-in. shanks.

GRINDERS — *Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* Wyco Tool Maker's Streamflex has a locking shaft holder which holds grinding wheel and shaft in fixed position for stationary grinding. There are four 1/3-hp. bench- and floor-type machines, in standard- or high-speed ranges, plus a ½-hp. floor-type machine.

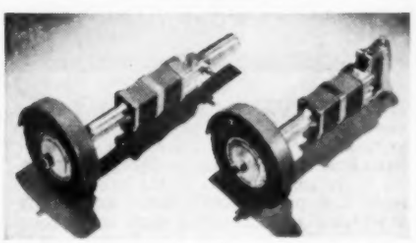


AIR GRINDER—*The Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* The B-30 vertical air grinder drives 6-in. cup wheels at 3500 to 5500 rpm. for vertical grinding. Also does sanding and wire brushing. Weight is 12½ lb. height is 8½ in. and the M-801 governor is employed.



HANDGRINDER—*The Dumore Co., Racine, Wis.* Duplex electric handgrinder comes with an attachment to convert it to a flexible shaft tool. It has ¼-in. capacity and can be adapted to 3/32- and ⅛-in. shank tools with collet sleeves provided. It can do jobs including sanding, sawing and drilling. A 1/14-hp. motor is used.

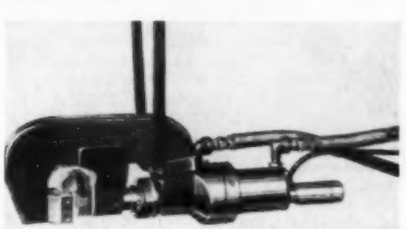
GRINDER — *Duro Metal Products Co., 2651 N. Kildare Ave., Chicago 39, Ill.* An improved heavy-duty grinder is driven by a motor said to develop 42 watts output at approximately 20,000 rpm. Working parts are air cooled by a propeller-type fan. Two collets are provided: one for 3/32 in. shanks and the other for ⅛-in. shanks.



AIR GRINDERS—*Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* Two airgrinders, D-325 for 8-in. wheels and D-125 for six-in. wheels, weigh 11¼ and 9¾ lb. A governor, M-801, idles machine at permissible free speed and as soon as pressure is applied, opens to deliver full air at high load speeds. Model D-325 has speeds of 4500, 4100 and 3100 rpm. D-125 has speeds of 6000 and 4100 rpm.

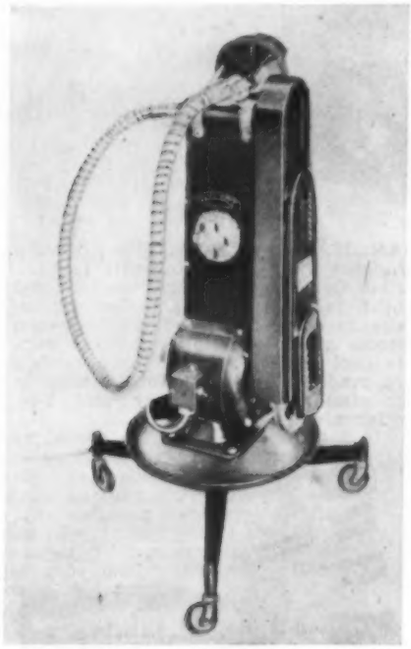
SANDERS, POLISHERS — *Bradford Machine Tool Co., Cincinnati 4, Ohio.* "Kool Grip" portable disk sanders and polishers incorporate a baffled air intake through the rear handle which directs air onto motor and keeps handle cool for operator. Three models are made: 7-in. heavy-duty sander, 9-in. standard-duty sander and 7-in. polisher.

IMPACT TOOL—*Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.* The Size 4U all-purpose electric impact tool can perform jobs such as reaming, tapping, drilling and hole sawing. It can apply (or drive) and remove screws, studs and bolts. Length is 10½ in. It has a free speed of 2000 rpm. and gives 1900 rotary impacts per min. under load.



SHEAR—*Hannifin Corp., 1101 S. Kilbourn Ave., Chicago, Ill.* Portable hydraulic shear cuts assembled parts that cannot be placed in a power saw or otherwise held securely for cutting. Capacities of various units are to 100 ton. When the button is pressed, an automatic cycle starts.

HAMMERS—*Dow Pneumatic Tool Co., 39 S. LaSalle St., Chicago, Ill.* Line of air-lubricated, air-cooled pneumatic hammers. Tool does not follow accepted principle of compression cylinders and has a loose-fitting piston.



FLEXIBLE-SHAFT UNIT — *Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* A variable-speed flexible-shaft machine known as Wycomatic Speed Changer, incorporates a dial control to instantly provide any speed within its range. It can perform jobs such as wire brushing, sanding, burring and grinding. Four models are available.

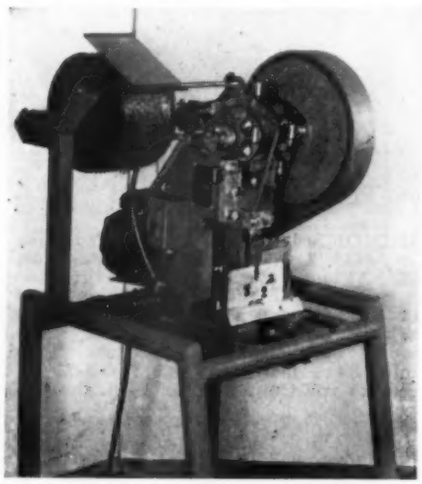
DRILL—*Aro Equipment Corp., Bryan, Ohio.* A high-speed air drill, Model 7022, designed for use on small drilling applications is recommended for drilling wood and non-ferrous metals, and for cleaning stamping dies and molds. The tool has a speed of 26,000 rpm. and will accommodate twist drills from 0 to ¼ in. shank size.

PNEUMATIC TOOLS—*Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill.* A line of pneumatic tools in 28 models include pneumatic hammers, drills, screwdrivers, nut runners and grinders. Drills, screwdrivers and nut runners are no longer than 7¼ in. nor heavier than 2¾ lb.

CARRYING CASE — *Sterling Tool Products Co., Chicago, Ill.* Gray glass-finished steel-carrying case includes in one case all of accessories and materials necessary for sanding and finishing with Sterling 1000 portable electric sander.

HAND TOOL—*Aircraft-Marine Products, Inc., N. Fourth St., Harrisburg, Pa.* Pneumatic hand tool, for installing solderless terminals, weighs approximately 3 lb., has interchangeable jaws for changing over from one type of terminal to another.

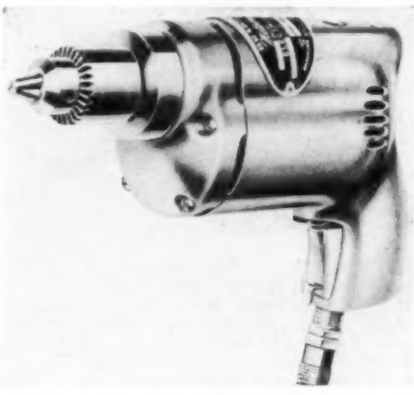
SCREWDRIVERS—*Keller Tool Co., Grand Haven, Mich.* Two pneumatic screwdrivers are for driving small screws. Model 1671 is for 2500-rpm. work with free-running machine screws to No. 3, and small self-tapping and wood screws. Model 1672 is for 10,000-rpm. work with screws in the No. 3 to No. 6 range.



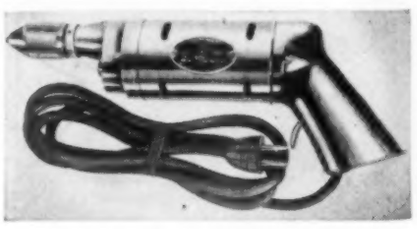
TERMINATOR — *Aircraft - Marine Products Co., N. Fourth St., Harrisburg, Pa.* Automatic wire terminator utilizes a continuous strip of solderless terminals and a completely automatic crimping cycle. Solid or stranded wire, sizes 22 to 10 and in special cases up to No. 6, is handled by machine.

TEMPOTOOL—*Tempotool Co., 3716 Clark Ave., S.W., Cleveland, Ohio.* The Tempotool can be used to fasten 1½-in. steel plates to concrete or steel. A cartridge is exploded, to provide power for the operation, by forward pressure of a plunger when the end of the barrel is pressed against the work.

SCREWDRIVERS — *The Aro Equipment Co., Bryan, Ohio.* Two air screwdrivers, Models 7037 and 7039 for No. 4 to No. 8 wood or machine screws have a new friction-clutch attachment, using ¼-in. hex shank bits or ¼-in. hex adapter with square drive for nut setting. Speed is adjustable to 1800 rpm.

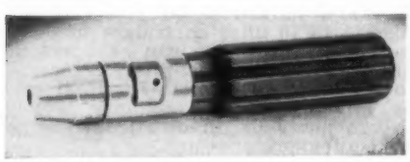


DRILL—*Bradford Machine Tool Co., Cincinnati 4, Ohio.* Metalmaster palm drill with ¼-in. capacity in steel is designed for one-hand operation. A special trigger switch is incorporated in the pistol grip for intermittent use. It can be locked for continuous operation. Speed is 1100 rpm. with full load.



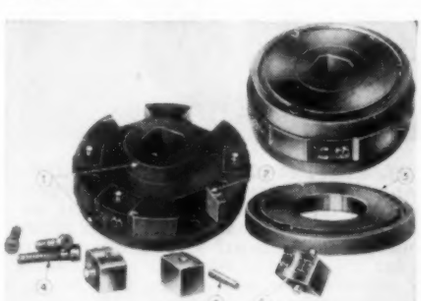
DRILL—*Portable Electric Tools, Inc., 255-59 W. 79th St., Chicago 20, Ill.* Lightweight Hi-Power Model No. 77 portable electric drill weighs 3 lb. 8 oz. Over-all length is 11 in. Capacity is ¼-in. drill in mild steel. No-load speed is 1700 rpm.; speed under full load is 900 rpm.

CENTER PUNCH—*Vinco Products, 326 Bond St., Asbury Park, N. J.* Automatic center punch in which the force of impact can be adjusted from 8 to 20 lb., uses hand pressure to actuate an internal hammer which strikes the point to produce the impression.



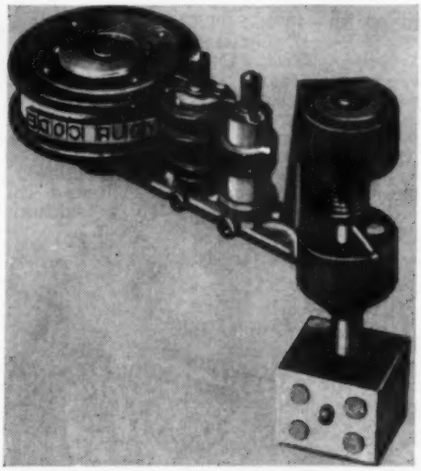
SCREWDRIVER — *Airdraulics Engineering, Inc., New Canaan, Conn.* The Model CSD-15 Trutorq screwdriver operates on the friction-disk principle. The calibrated head permits the operator to set desired torque from 1 to 15 lb.-in. without the use of other calibrating devices.

CENTER PUNCH—*Satterlee Products, 755 Boylston St., Boston, Mass.* Impakt self-acting center punch provides force by pulling back a control knob and releasing it so that the coil spring contracts at high velocity and delivers a sharp blow to the point. The punch has 5/16-in. dia. and is 5 in. long.

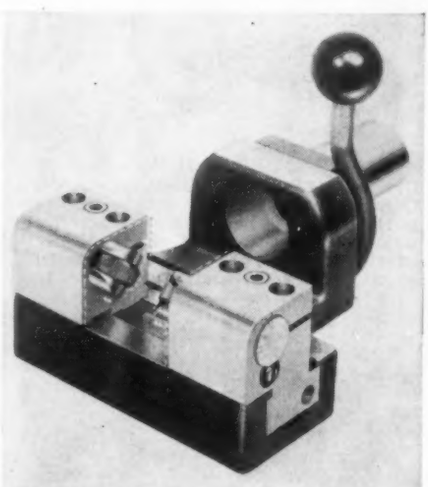


INSERT ROLL—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* Insert roll is for marking steel tubing after the final operation performed on sizing rolls. The roll consists of (1) a slide ring and hub, (2) a type insert ring, (3) a locking ring to hold the type in place.

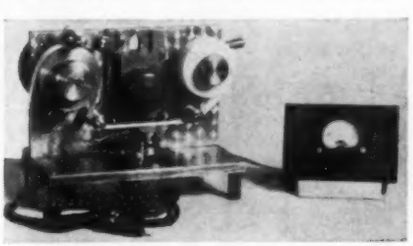
STAMP-HOLDER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* Stamp holder in single- or double-line styles is of one piece of alloy steel. Holder is shaped out to permit positioning of stamps on tubing and pipe as well as on flat surfaces. Recommended stamp sizes are ⅛ to ⅜ in.



STARTING DEVICE—*Adolph Gottscho, Inc., 1 Hudson St., New York 13, N. Y.* Rolacoder Jr. marks cartons, cans, rolls of textiles and paper. Interchangeable rubber-type surface inked automatically after each imprint.

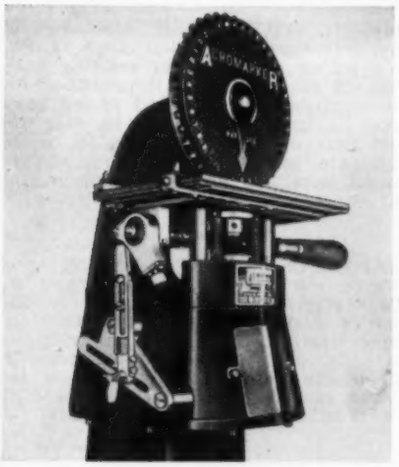


KNURLING TOOL — *Universal Vise and Tool Co., Parma, Mich.* Retractable knurling tool is adaptable to engine or turret lathes, can knurl long, thin work and at the same time clear threads, pilots and other sections of the same diameter as the portion to be knurled. Knurls up to 2-in. dia.

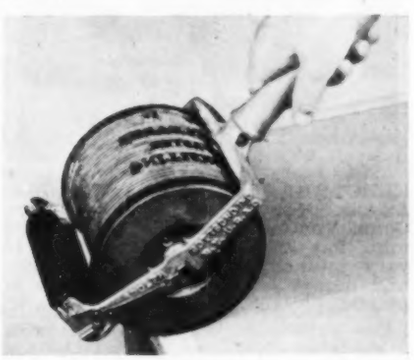


EMBLEM PRINTER—*Craft Machine Co., 57 E. Fifth St., Peru, Ind.* A hot stamp press for printing lettering and emblems on plastic parts has a range from 0 to 600 F. Press is hand operated with printing tape fed on return stroke. Length of feed can be varied from ¼ to 1¾ in.

STAMPING — *New Methods Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* Device for annular marking uses combination of solid stamp and interchangeable type.



NAMEPLATE MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* The No. 1F nameplate-stamping machine has been improved with a combination feature. A new clutch incorporates a lever-operation movement controlled by a thumbscrew. It is used in conjunction with and connected to an additional lever arrangement that determines the stroke by simple adjustment of a wing-nut which advances or retards in an elongated slot.



MARKING UNIT—*Adolph Gottscho, Inc., 1 Hudson St., New York 13, N. Y.* The Rolamarker, a high-speed, manual marking unit, is said to be four times faster than stencilling; the unit marks paper, metal and plastics. Available in three sizes, it affords impressions up to 5x12-in. area. Interchangeable rubber type and type holder have a ribbed-base construction which permits many sizes or styles to be used.

MARKING FIXTURE—*Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* The 9A fixture is designed to be screwed to the bed of any Series 9A marking machine. It is an adjustable device which permits various sizes of couplings to be marked.

INK-PRINTER—*Jas. H. Matthews & Co., 3956 Forbes St., Pittsburgh 13, Pa.* A printing machine, for making continuous or spaced ink impressions on steel prints both flat and round bars from ¼ in. square or ¼ in. dia. up, and flats or sheets from ¼ in. wide. Separate machines are required for round bars, for flats or squares, and for sheets and strips.

MARKING MACHINE—*The Noble & Westbrook Mfg. Co., 17 Westbrook St., East Hartford, Conn.* Model No. 253 marks designs and names into thin-wall lipstick cases or similar parts to ¾-in. dia. (or larger, if specified). 10 loading stations carry work between marking die and pressure dial. Parts at rate of 60 to 80 per min.

ROLL MARKER—*New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* An automatic roll marker for imprinting letters, numbers, calibration lines and serrations on finished metal parts, can be used for right- or left-hand operation.

ELECTRIC MARKING TOOL—*New Britain Machine Co., New Britain, Conn.* Tool vibrates 7000 strokes per min., has knurled adjusting collar to vary intensity. Cuts initials, designs and names on metal, glass, wood or plastic.

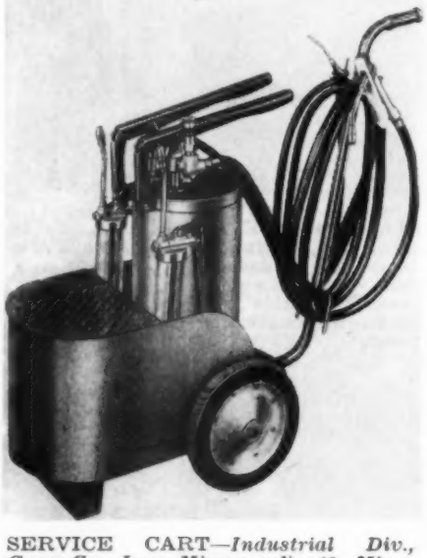
MARKING MACHINE—*Jas. H. Matthews & Co., 3956 Forbes St., Pittsburgh 13, Pa.* The No. 203 marking machine for precision marking of cylindrical or cone-shaped parts such as machine-tool feed dials. Made in two models: motor-driven unit marks parts to 6-in. dia. with graduation numbering and small amount of lettering; hand-operated bench model marks parts to 3-in. dia. with graduations and numbers.

STAMP—*New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* Semi-universal self-centering and self-aligning holder for marking various sizes of solid round bar stock with part numbers and other data.

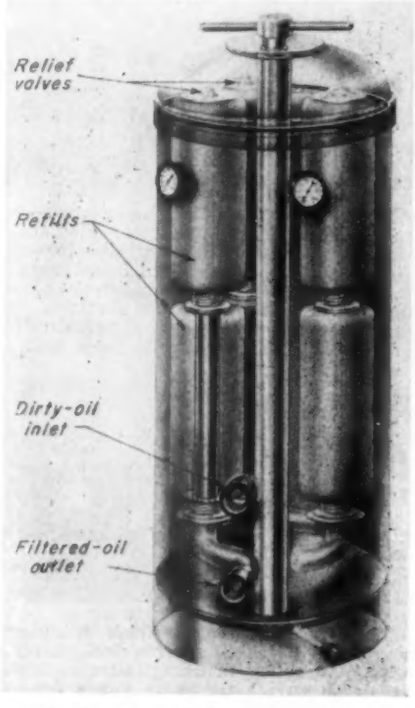
ENGRAVING—*The Acromark Co., 7-13 Morell St., Elizabeth, N. J.* Comparable to straight stamping, the "Vari-Angle" method of engraving is employed to provide a means to insure accuracy in roll marking. The accuracy of roller dies comes from the angle of engraving characters around the periphery of the roll.

STAMP—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh, Pa.* The "Nu-Grip" safety-steel stamp has a countersunk "finger-sized" hole on all four sides for better grip. It is available in all standard sizes from 1/32 to 1 in.

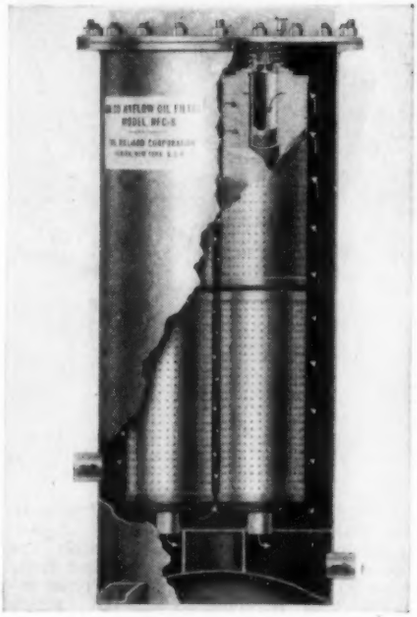
LUBRICANT SYSTEM—*Lubrication Div., Rivett Lathe & Grinder, Inc., Brighton, Mass.* Pulsolator automatic oil lubricating system can be engineered to provide controlled oil delivery by gravity or under pressure to selected bearings while, at the same time, it directs continuous flood lubrication to inclosed bearings and gear trains. Systems can be designed to lubricate from 1 to 400 individual bearings.



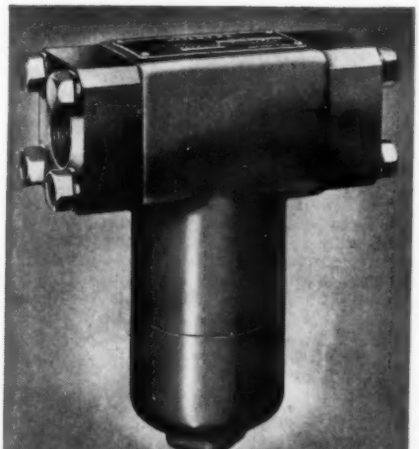
SERVICE CART—*Industrial Div., Gray Co., Inc., Minneapolis 13, Minn.* Considered complete lubrication department on wheels. The Graco Lube unit carries supply of three different lubricants, two 1-lb. lever guns, one ½-pt pistol oiler and a large tool box.



OIL FILTERS—*Briggs Filtration Co. (formerly Briggs Clarifier Co.), Bethesda 14, Md.* In Model D-6-BR-SV2, one of a line of oil filters, oil under pressure enters at inlet, passes through the refill elements and out of outlet connection. Oil (and air or foam) that does not go through refill elements, passes through relief valves.



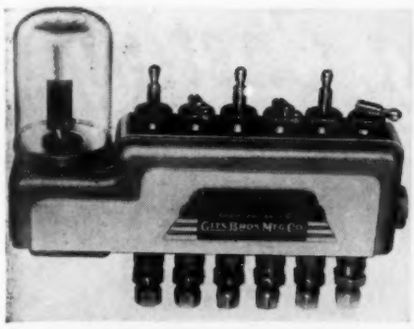
OIL FILTERS—*The Hillard Corp., 102 W. 4th St., Elmira, N. Y.* Lubricating, fuel and industrial oil filters utilize from 1 to 18 filter cartridges measuring 7¼x18 in. They can be operated as by-pass or full-flow filters. Pressure to force the oil through the filter can be provided by an auxiliary motor-driven pump or directly from engine or equipment pressure.



OIL FILTER—*Vickers Inc., 1410 Oakman Blvd., Detroit, Mich.* Proportional-type oil filter, using a venturi design, features a cartridge which filters out particles down to two microns in size.

LUBRICATOR — *Bijur Lubricating Corp., 43-01 22nd St., Long Island City 1, N. Y.* Automatic type A lubricator, for high-speed production machinery, provides controlled discharge of oil under high pressure at prescribed brief intervals. It is a combination gear pump and reservoir, generally supplied with a 3- or 6-pint reservoir.

OILER—*Oil-Rite Corp., 3486 S. 13th St., Milwaukee 7, Wis.* Wick-Feed oiler for feeding filtered oil is available in five sizes with capacities from ½ to 8 oz. Oil in Lucite reservoir is carried through the wick over the stand pipe to the bearing by capillary action.



OILER—*Gits Bros. Mfg. Co., 1846 S. Kilbourn Ave., Chicago, Ill.* The "GM" multiple oiler serves as a central point for oiling multiple remote bearings. The transparent constant-level reservoir is made of unbreakable plastic and has a non-spill valve to simplify refilling.

LUBRICATOR—*SKF Industries, Inc., Philadelphia 34, Pa.* Oil-mist lubricator is designed to lengthen life of spindle bearings. Several drops of oil per hr. will lubricate medium-sized ball bearing operating at moderately high speeds.

LUBRICATION—*Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.* Glycolube series of lubricating compounds for drawing, sheeting and stamping non-ferrous metals are said to automatically apply a temporary corrosion-inhibitor film, and permit continuous lubrication. Available in various forms, from liquids to solids.

CUTTING OIL—*Machinery Lubricants, Inc., 31 St. James Ave., Boston 16, Mass.* Silver-Chip No. 60 cutting and grinding oil is said to mix with water of any hardness and produce a solution instead of emulsion. Mixtures of 1:25, 1:50 and 1:100 are said to produce transparency as well as high lubricity.

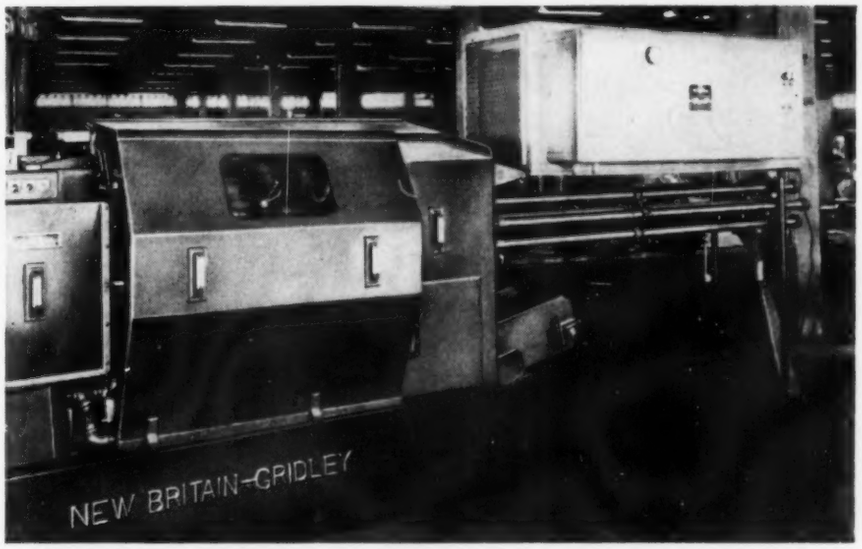
CUTTING OILS—*Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.* Petrofac, made entirely from petroleum, is a new ingredient in cutting oils. Cutting oils are claimed to give longer tool life and improved finishes by eliminating both animal and vegetable fats.

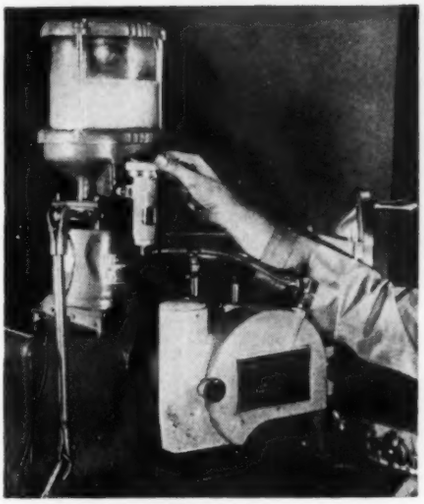
RUST PREVENTIVES—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.* Nine rust-preventive formulations include: four removable thin-film solvent types, one non-removable dielectric variety, and four oil-type films varying from thin-oil film to medium-grease consistency.

COOLANT—*Anderson Oil Co., Inc., Portland, Conn.* Lusol, a liquid concentrate used with 10 to 75 parts of water is said not to evaporate or become rancid. Low interfacial tension is claimed for the substance, which would permit it to rapidly get between tool and chip to prevent formation of heat.

OIL—*Wynn Oil Co., Dept. AM, San Gabriel, Calif.* Friction proofing oil used with regular lubrication oils and greases is compounded for the protection of bearings, cams and other friction points in motors and machinery.

SILICONE OILS—*Dow Corning Corp., Midland, Mich.* DC 710 silicone oils for lubrication at temperatures from 10 F. to 500 F. may be used in timing mechanisms, precision instruments and oven conveyors.





COOL GRINDING—*The DoAll Co., Des Plaines, Ill.* Method of cooling work during grinding introduces coolant at point of contact between wheel and work. The system is said to eliminate need for splash guards, settling tanks, pumps, motors and similar equipment. Temperatures are claimed to be held several hundred degrees below those found in conventional wet-grinding systems.

CUTTING OIL—*Gulf Oil Corp., Pittsburgh, Pa.* A soluble cutting oil is claimed to be all-water miscible, have high-lubricating qualities, have a pleasant odor, and, non-foaming and rust-preventive characteristics.

CUTTING OILS—*E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.* Four new series of Cut-Max straight cutting oils. The 100 series includes a range of viscosities of cutting fluids high in saponifiable oil content, but containing no sulphur or extreme pressure additives. The 200 series for heavy-duty machining is highly fortified with sulphur, E.P. and saponifiable. The five oils are identical in additive content but vary in viscosity. The 300 Series includes oils high in saponifiable content and active sulphur but free from chlorine—for use on bright machined surfaces. The 400 series includes light-colored, clear oils said to be mildly but effectively treated. They are intended for automatic, high production jobs where feeds are light, speeds high.

TEMPERATURE CONTROL—*Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y.; installed by New Britain-Gridley Div., New Britain Machine Co., New Britain, Conn.* Coolant-temperature-control unit for application to New Britain-Gridley automatic screw machines is said to increase production by eliminating warm-up operations and subsequent tool adjustments. Coolant is kept at a pre-determined temperature.

ADDITIVE—*Alox Corp., 3934 Buffalo Ave., Niagara Falls, N. Y.* Alox 162, a universal oil additive, is said to improve the lubricity of all types of lubricating oils and increase their life under high temperatures and pressures.

CUTTING FLUID—*The Penetone Co., Dept. 12, Tenafly, N. J.* Triple-acting cutting fluid is said to combine requirements of lubrication cooling and cleaning. It is a non-toxic, non-flammable liquid concentrate. It is diluted with approximately 15 parts of water for use as a cutting fluid.

ADDITIVES—*Lubricants, Inc., Fisher Building, Detroit 2, Mich.* Cutting-oil additives Cresol Z-2 and Cresol Z-2-A are designed to assist in the production of cutting-oil coolants, drawing compounds, metalrolling, forming, and extreme-pressure lubricants. They are non-vesicant, and are claimed not to cause, but prevent, skin infection.

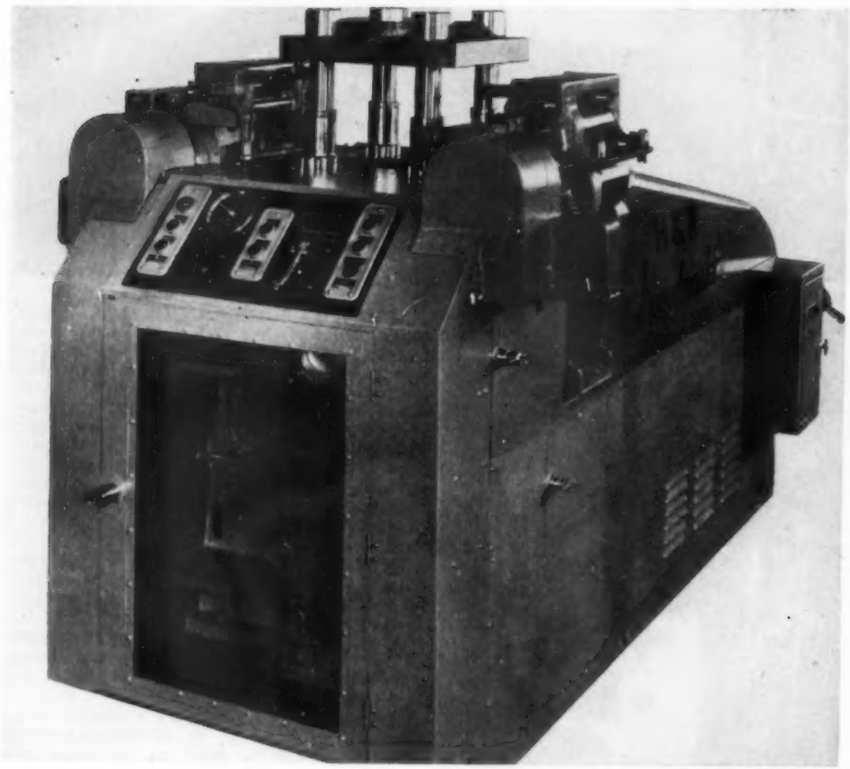
LUBRI-CLEANER—*McBeth Machinery Co., 1109 Grant Bldg., Pittsburgh 19, Pa.* Pressure Lubri-Cleaner, for use in rolling mills, hammer and forging plants, and other industrial organizations, lubricates as it cleans.

LUBRICANT—*G. W. Smith & Sons, Inc., 5400 Kemp Rd., Dayton 3, Ohio.* Die Slick No. 5, a metalworking lubricant for high pressures, or both, is used on ferrous or non-ferrous metals for such applications as hot-drawing, hot-piercing, hot-forging and deep-drawing operations. Said to withstand pressures of more than 100,000 psi. and temperatures to 2300 F.

CUTTING-OIL BASE—*Quaker Chemical Corp., Conshohocken, Pa.* Quaker Kut 85 a transparent, odorless cutting-oil base is for use in applications that generally require fat and sulfurized-fat types of cutting-oil bases. It can be blended with 100 or 200 viscosity oil or kerosene.

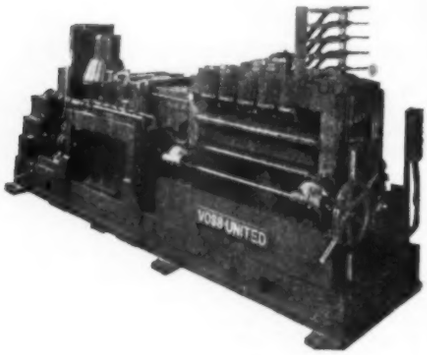
AMERICAN MACHINIST 35th ANNUAL REVIEW

Forming, Forging, Casting



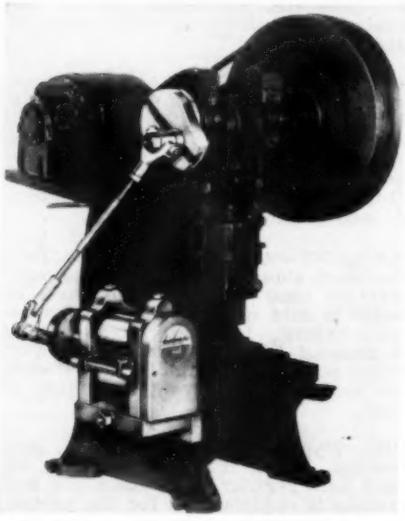
PRESS—*Henry & Wright Mfg. Co., Hartford, Conn.* Speedmaster 25-ton dieing machine provides precision guiding for carbide and high-carbon, high-chrome dies with a speed range to furnish maximum die life. Speed range is 235 to 700 strokes per min. Counterbalance mechanism makes it possible for press to operate at top speed without being fastened to floor.

TOGGLE PRESS — *The Cleveland Punch & Shear Works Co., Cleveland 14, Ohio.* A single-point double-action toggle press has single connection, 28-in. stroke with 6-in. adjustment, 500-ton capacity for inner slide and 300-ton capacity for outer slide. It can be furnished in other sizes and with two connections.

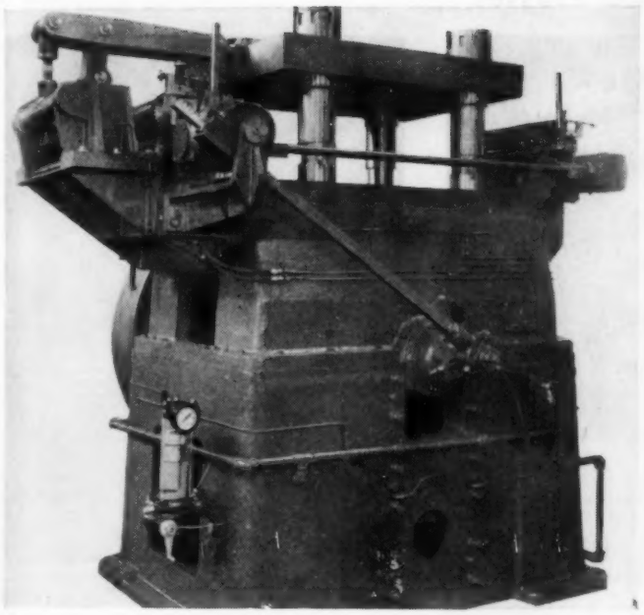


ROLLER LEVELER—*Voss Machinery Co., 2882 W. Liberty Ave., Pittsburgh 16, Pa.* "Inverted Type Leveler" has tiltable lower rolls, while the upper flight of rolls does not tilt. The unit has ¾-in. dia. work rolls. It flattens alloy and perforated sheets from 0.010 to 0.030 in. thick and up to 28 in. wide.

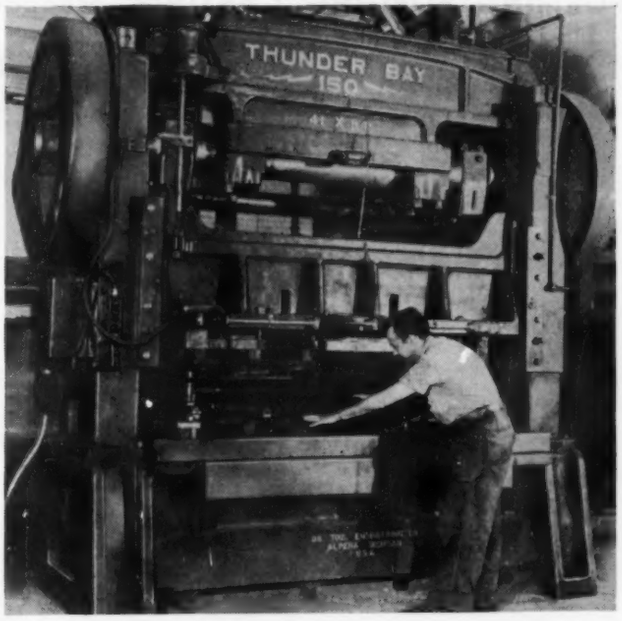
PRESSES—*Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill.* Series "S" presses are double-crank type with twin end drives. Most sizes can be furnished either single or double geared, and capacities range from 60 to 250 ton. Bed lengths range from 36 to 108 in., in 6- and 12-in. increments.



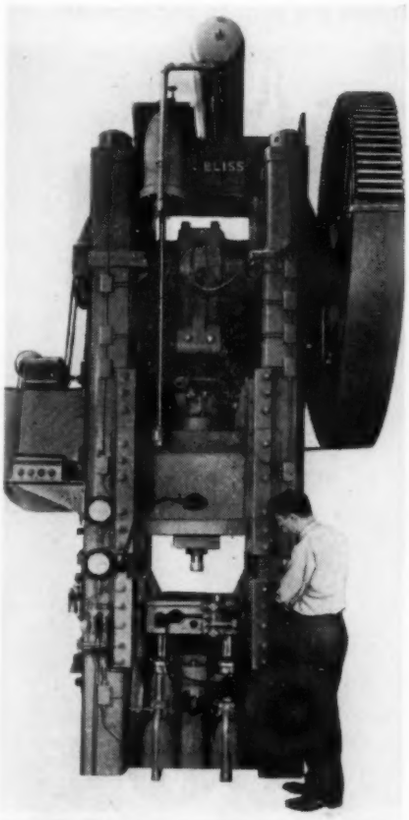
FEED—*Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles 6, Calif.* An automatic friction roll feed is used with metal, wood, plastic, cardboard and felt. Stock up to 3 in. wide can be handled, with thickness from 0 to 3/16 in. in thousandths. Full operation is 285 per min.



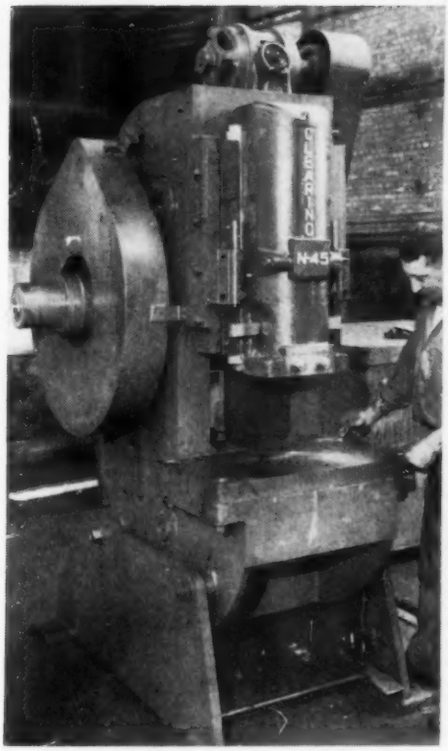
AUTOMATIC PRESSES — *Brandes Press Co., 6408 Euclid Ave., Cleveland, Ohio.* Presses are available in sizes from 30- to 750-ton capacity. Designed for progressive-die work, the units have large bed areas, and feature high-speed operation for blanking, forming and drawing work.



150-TON PRESS—*Die Tool Engineering Co., 18800 Hawthorne Ave., Detroit 3, Mich.* Machine has 41x84-in. bed size. Double back gearing and Rockford friction clutch are features of the Thunder Bay line. Other models are 100, 150, 200, 250, and 300 ton, in variety of bed sizes.

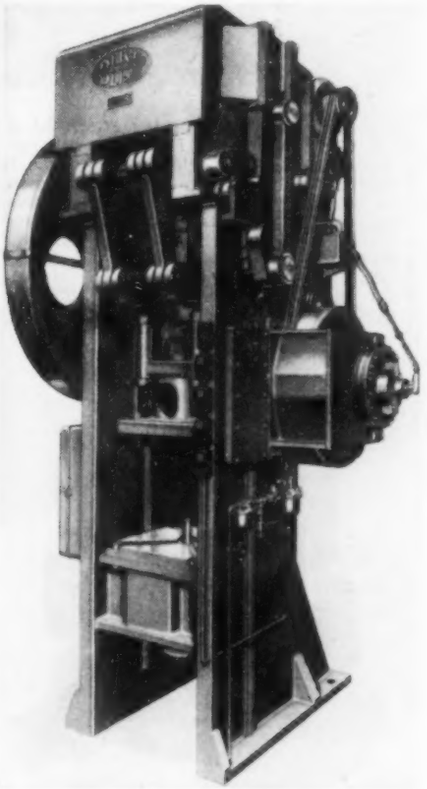


PRESS—*E. W. Bliss Co., 450 Amsterdam Ave., Detroit 5, Mich.* No. 309 mechanical briquetting press designed to produce large, complex powdered-metal parts has 345-ton slide capacity. Slide has 10-in. stroke and carries adjustable cam which actuates powder hopper. A triple hydraulic motion is built into the press: floating die table, core rod and stripper.

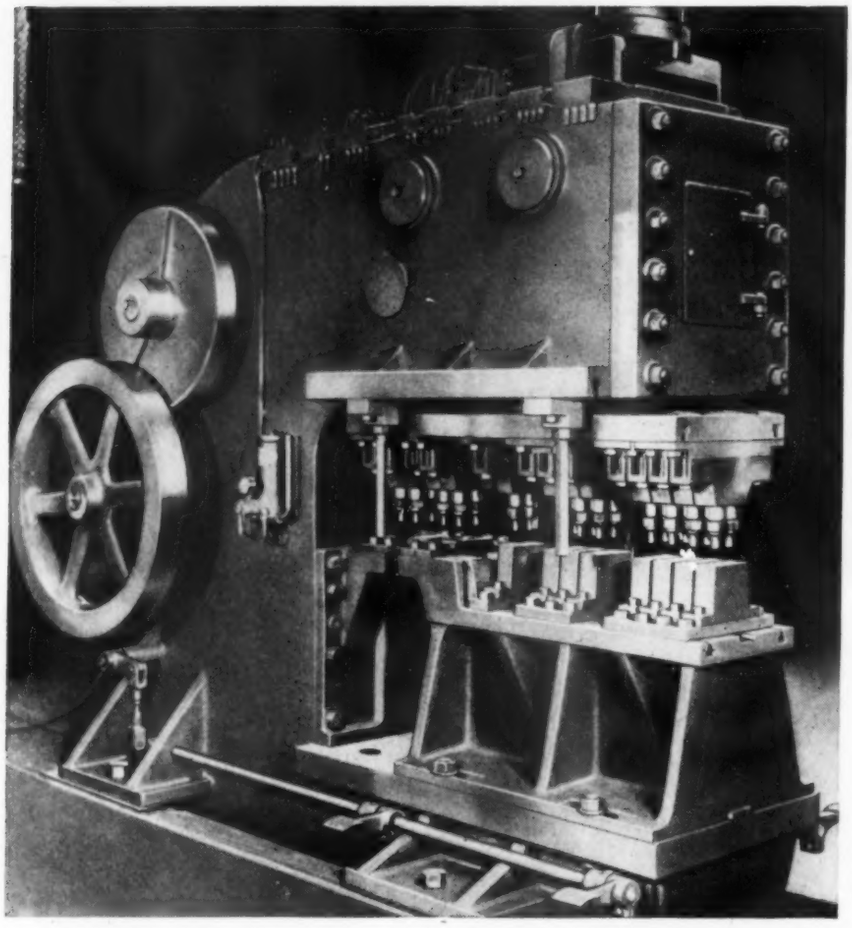


GAP-TYPE PRESS—*Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill.* Non-Flex inclinable gap-type press places the point of loading close to the neutral axis to eliminate deflection of the C-frame. Conventional crank drive of slide has been replaced by a rocker arm operated from an eccentric drive located in back of press. The unit has 45-ton capacity and 4-in. stroke. Flywheel model operates at 90 strokes and back-geared model operates at 45 strokes per min.

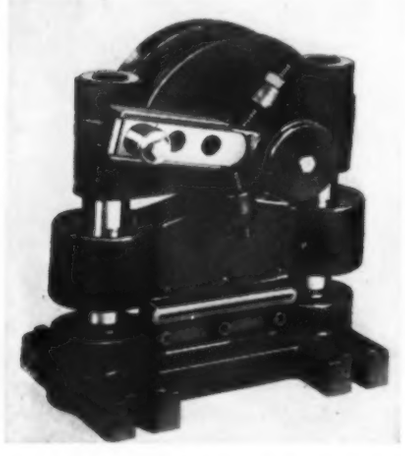
SPACERS—*Federal Tool & Mfg. Co., 3212 N. Washington Ave., Minneapolis, Minn.* Stripper-bolt compensator spacers, eliminate necessity of counter-boring stripper plates or shortening stripper bolts when a punch is ground to the extent that the stripper plate is too high. Spacers come in all sizes.



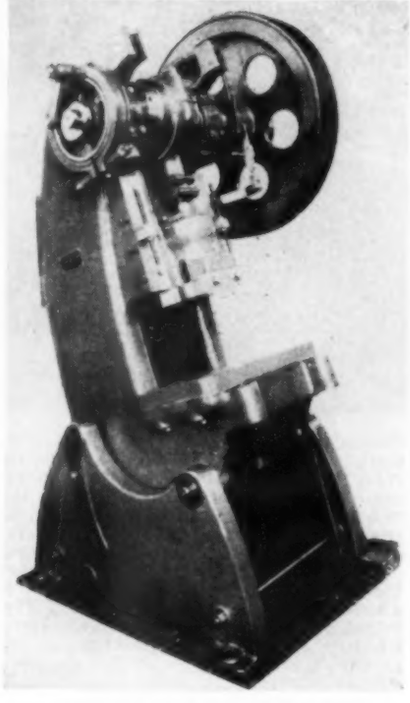
TOGGLE PRESSES—*E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich.* Single-crank toggle presses in eight sizes range from 4¼- to 7-in. shaft dia. and from 8½- to 24½-in. stroke length. Used for deep drawing of steel, brass, copper, aluminum and other metals, presses are of welded-steel construction.



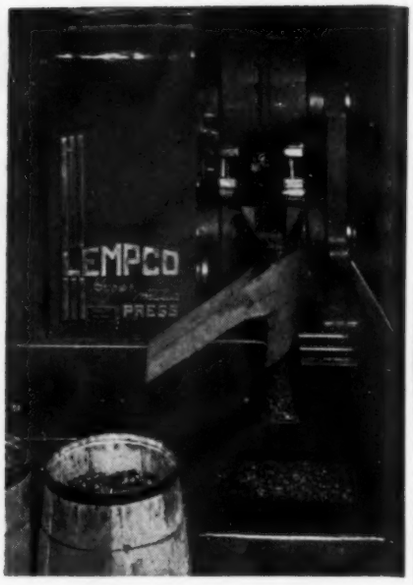
TOGGLE PUNCH—*Beatty Machine & Mfg. Co., Hammond, Ind.* Size 12 toggle machine does both flange and web punching on structural steel shapes in one handling. Punching tools have double-gage punching and die holders on each pitch line which permits punching two diameters on the same pitch line. Control levers for duplicate punching are provided. Throat depth is 25 in. Face of table is 22x49 in.



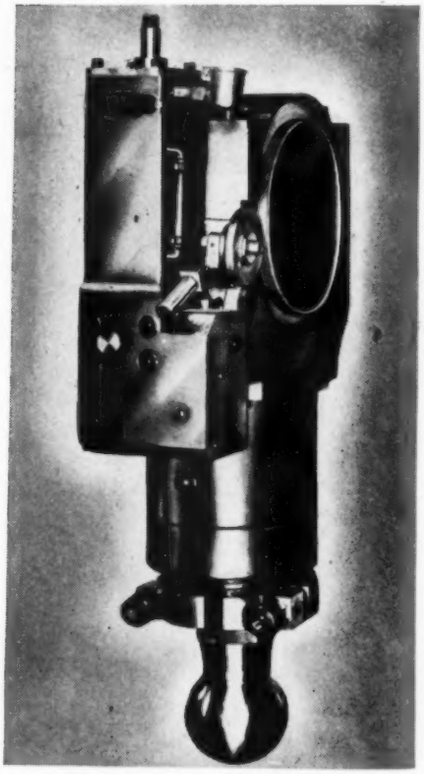
SCRAP CUTTER—*Haller Machine & Mfg. Co., Inc., 7940 Tireman Ave., Detroit 4, Mich.* Model D-611 ram-driven scrap cutter is for use on almost any punch press. It mounts on the bolster plate, is driven directly by ram or die and is adjustable for any ram-stroke length to 6 in. Stock up to 4-in. wide and 3/32-in. thick can be cut.



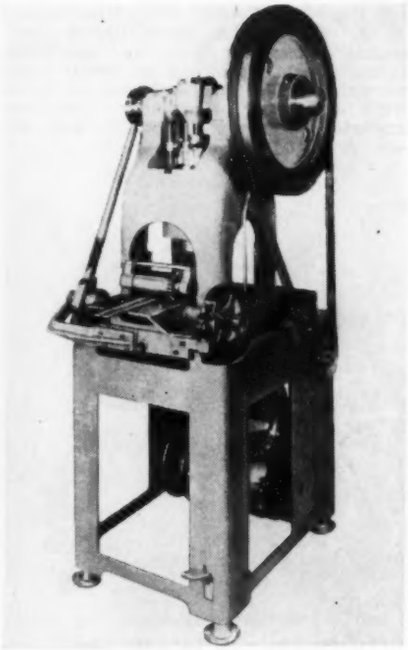
INCLINABLE POWER PRESS—*Wegner Machinery Corp.; distributed by J. I. Bernitz, Inc., 321 Broadway, New York 7, N. Y.* The Universal inclinable open-back power press No. 4 has adjustable stroke length from ¾ to 4¼ in. Operation may be non-repeat or continuous. 80 to 90 strokes per min. are available.



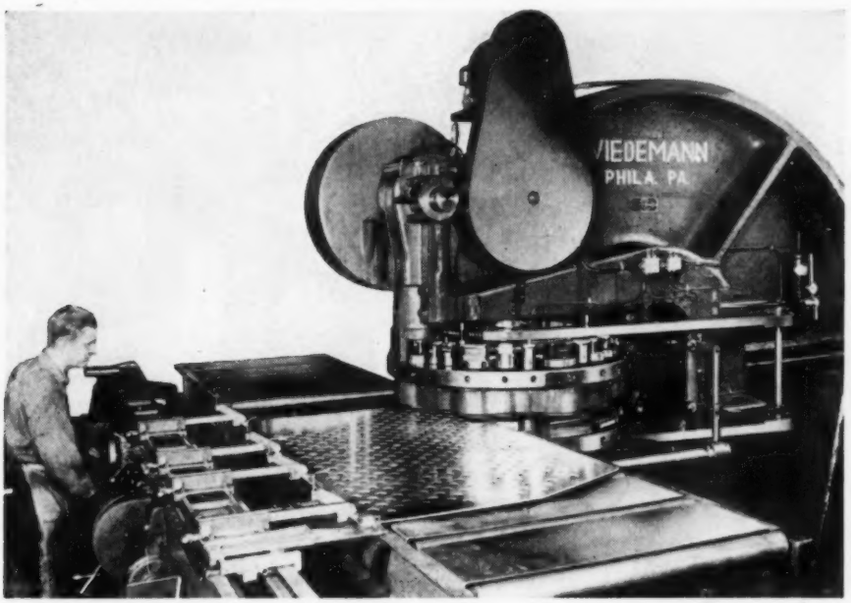
PUNCH PRESS—*Lempco Products, Inc., Bedford, Ohio.* Up to 1800 strokes per min. can be obtained on the "Hypermatic." Made in 10- and 50-ton models, it uses rotary motion to actuate the dies. Any force developed is opposed by a similar force said to absorb it and completely eliminate vibration. High velocity results in about 10% cut and 90% break. Maximum stock feed is about 10,000 lineal inches per min. on 50-ton model.



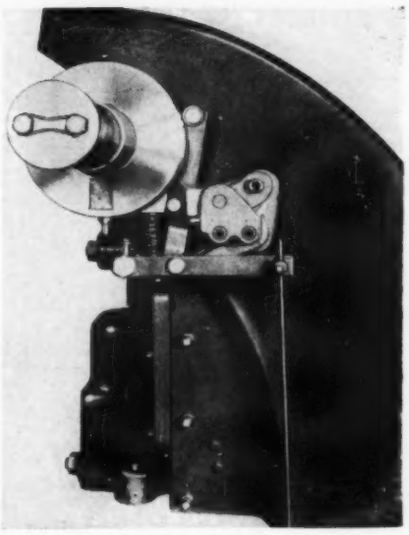
CONNECTING LINK—*Dayton Rogers Mfg. Co., 2835 12th Ave. South, Minneapolis, Minn.* Model HP hydraulic safety overload connecting link is designed to replace the conventional pitman and ram-adjusting screw on punch presses of 37- to 250-ton capacity. It can compensate for stock thickness variation and is said to provide a constant ram pressure at point of operation.



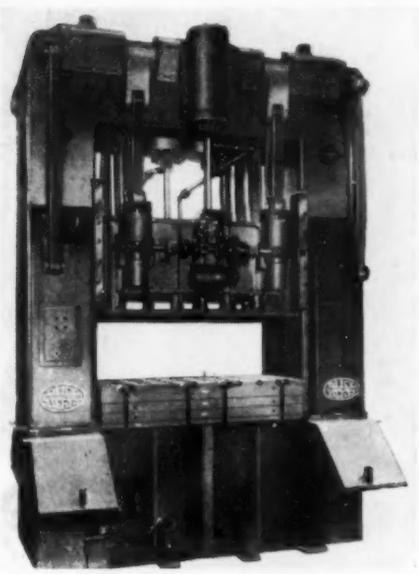
PRESS—*Di Machine Corp., 2711 W. Irving Park Rd., Chicago 18, Ill.* The 12-ton Diebel Hi-Speed automatic press with automatic roll feed and variable-speed drive, takes standard 8½x6¼-in. diesets. Special diesets measuring to 8x12 in. can be used. Shut die height is 6 in. Press operates at 65 to 300 strokes per min.



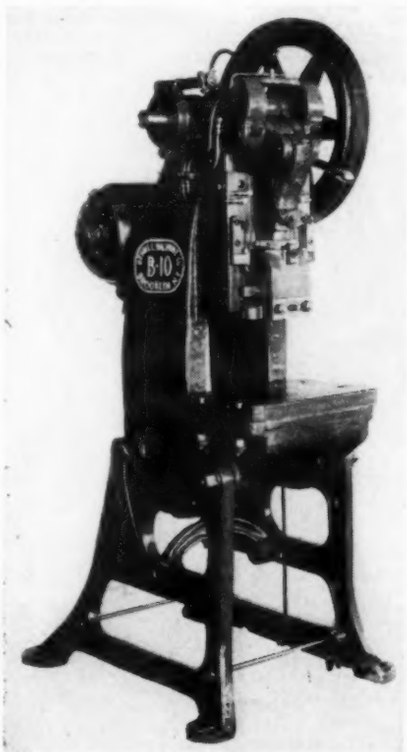
PUNCH PRESS—*Wiedemann Machine Co., Philadelphia, Pa.* Turret punch press is for short-run piercing operations. Type R-7 with gage table will pierce different shaped holes to 6 in. square in sheets to 60x120 in., ¼ in. thick. It holds 12 to 32 punches and dies and will make 65 strokes per min.



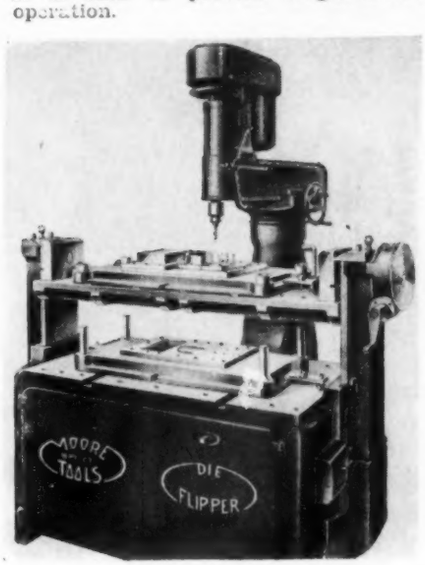
INCLINABLE PRESS—*Federal Press Co., Elkhart, Ind.* All open-back inclinable presses from 6 to 80 tons now have non-repeat clutch mechanism. No tools are needed to change machine from single to automatic cycle. It is said to provide single-stroke operation.



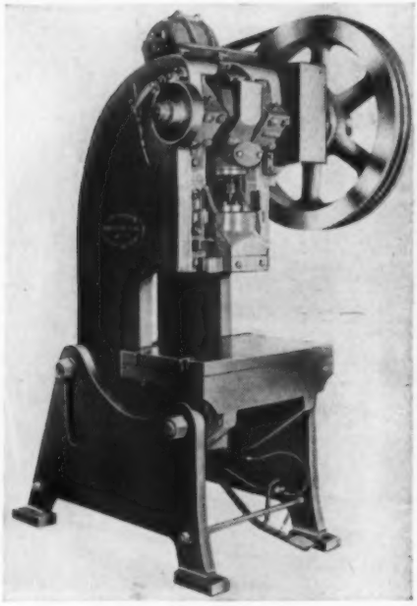
TOGGLE PRESS—*E. W. Bliss Co., 150 Amsterdam Ave., Detroit 2, Mich.* A toggle-press line for triple-action drawing of large automobile stampings is available in a wide range of capacities and any width. Presses have 4-point suspension on both the upper slides which are timed and mechanically locked with a crank-driven lower plunger in the bed. The toggle-linkage system gives unusually long dwell to blank-holder and sufficient dwell to upper plunger to perform redraw work with lower slide.



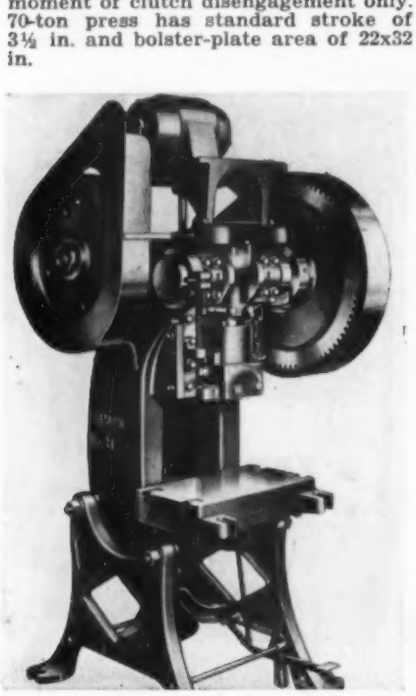
TOGGLE PRESS—*Bennel Machine Co., Inc., 20 Grand Ave., Brooklyn 5, N. Y.* A 10-ton inclinable toggle press is designed for operations such as blanking, forming, drawing and bending. The unit employs diminishing speed on downward stroke and slow return stroke. The press operates at 150 strokes per min.



DIE TRYOUT—*Moore Special Tool Co., Inc., 740 Union Ave., Bridgeport 7, Conn.* The Die Flipper, a diemaker's tryout and assembly machine enables one operator to perform all operations of die assembling: take apart, turn over, drill, tap and try out. The machine will take apart and flip a die set of 20x40 in. with 12-in. shut height.



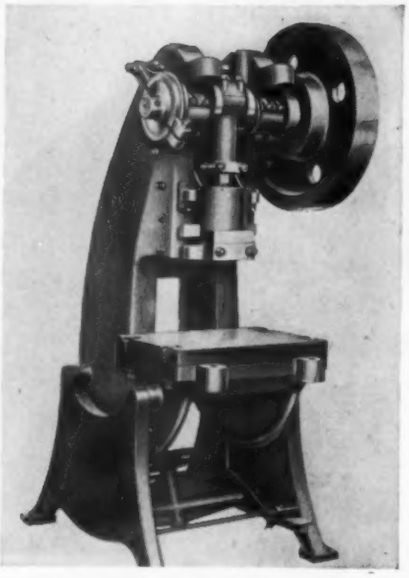
PUNCH PRESS—*Superior Punch Press Co., 3610 Superior Ave., Cleveland, Ohio.* Welded-steel punch press in 70- and 100-ton capacity has self-energizing brake which is applied at moment of clutch disengagement only. 70-ton press has standard stroke of 3½ in. and bolster-plate area of 22x32 in.



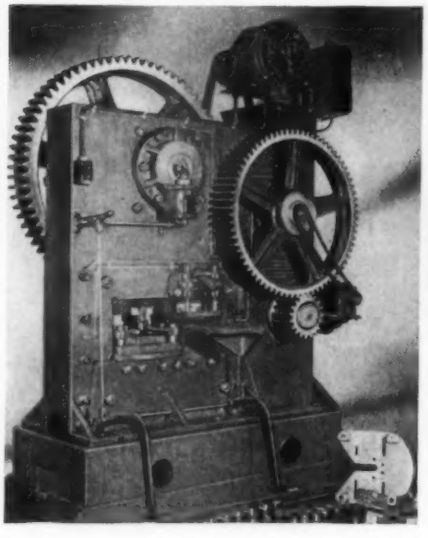
PUNCH PRESS—*Diamond Machine Tool Co., Los Angeles, Calif.* A 31-ton back-geared punch press adds back gears and a stronger frame design. Bed area is 13x22 in., while stroke is 3 in. The cradle arrangement permits the press to be operated at any degree of inclination.

CLUTCH, BRAKE—*Cleveland Punch and Shear Works Co., Cleveland 1¼, Ohio.* Drum-type air friction clutch and brake can be applied to any size press, new or old, either flywheel or back geared.

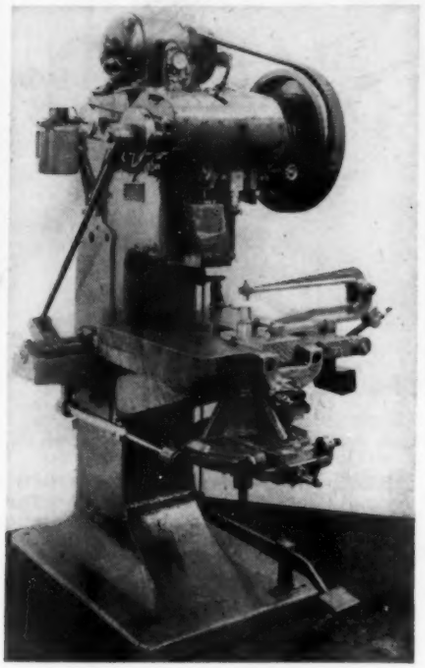
PUNCH, SHEAR—*Buffalo Forge Co., Buffalo 5, N. Y.* Locomotive-spring punch and shear, No. 9, cuts 7x¾-in. steel for locomotive and tender springs. →



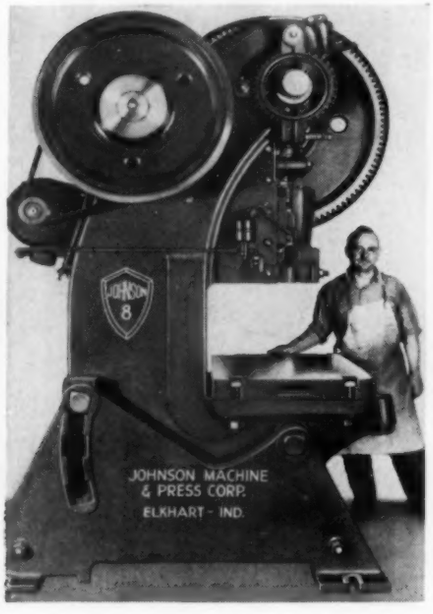
PUNCH PRESSES — *Vernon Press Div., Ran Corp., Richmond, Cal.* Open-back inclinable presses are designed for heavy-duty service, have flywheel drive on 30, 40-, 50- and 90-ton capacity models. Back-geared drive will be available on 50- and 90-ton models.



PRESS—*British Machine Tools, Ltd., 367 Diamond Bridge Ave., Hawthorne, N. J.* Dunbar & Cook 10-ton horizontal press for piercing, marking, forming and blanking of small components is compact and can be fitted with dial, roll or gripper feed and operated at from 70 to 200 rpm. de- ← pending on feed.

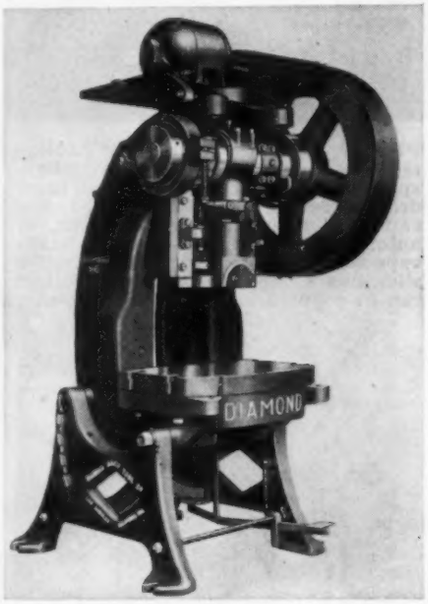


NOTCHING—*V & O Press Co., Hudson, N. Y.* Notching press is used for notching rotor laminations for electric motors. It will operate at speeds to 800 strokes per min.



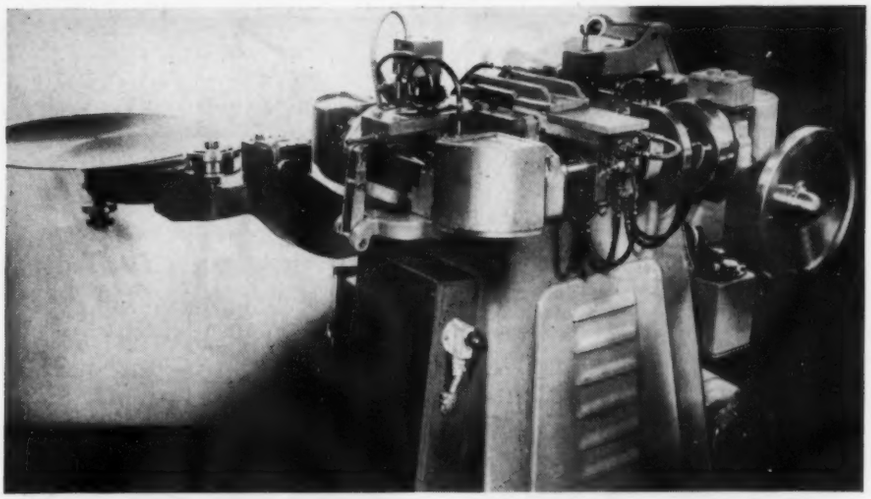
INCLINABLE PRESS—*The Johnson Machine and Press Corp., Elkhart, Ind.* Inclinable power press of 90-ton capacity can be used in horizontal position or can be tilted back at a 25° angle so that work will drop away from press without use of an ejector. This press handles work to 15-in. depth and produces 44 pieces per min.

PRESS—*Rodgers Hydraulic, Inc., Minneapolis, Minn.* The Rodgers production press Whitley Model No. 12 is a mechanical press with 1- to 4-ton capacity. Design of the unit permits ram or arbor to be rapidly adjusted to the work by hand.

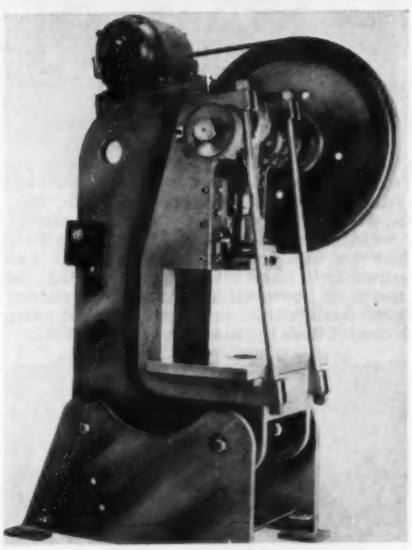


PUNCH PRESS—*Diamond Machine Tool Co., Los Angeles, Calif.* Plain-type punch press is made in 55- and 56-ton capacities. Frames are of open-back, inclinable construction with bearing and sliding surfaces micro-finished. 56-ton model has standard stroke of 3 in., and 100 strokes per min.

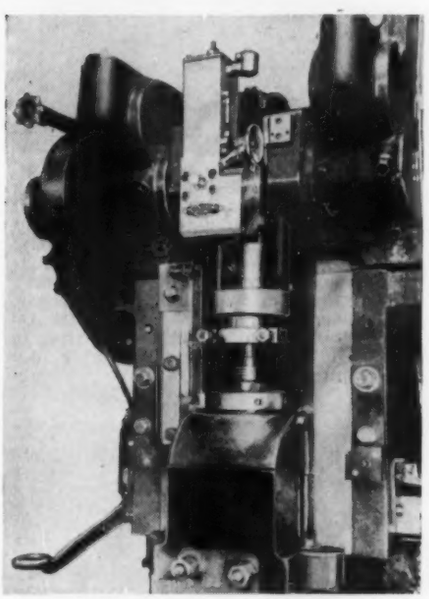
OVERLOAD JACK—*Dayton Rogers Mfg. Co., Minneapolis 7, Minn.* Hydraulic overload jack and connecting rod, model HJ, for use on large single- and double-crank straight-side punch presses, is said to avoid all press overloads. Built in sizes from 50- to 500-ton working capacity.



MULTI-SLIDE MACHINE—*U. S. Tool Co., Inc., Ampere (East Orange), N. J.* No. 11 Multi-Slide machine is designed for high-speed automatic fabrication of small precision stampings from coil stock. It will run speeds to 500 strokes per min., and accommodate stock ¾ in. wide. Feed length is 0 to 3 in.



PUNCH PRESSES—*Southwest Tool & Die Co., 2311-2321 Southwest Drive, Los Angeles 43, Calif.* Seele inclinable punch presses are made in two models 35- and 70-ton near bottom of stroke. 35-ton model has 3 hp., 1200 rpm. Stroke is adjustable, standard being 2½-in. 70-ton model requires 5-hp., 900-rpm. motor.

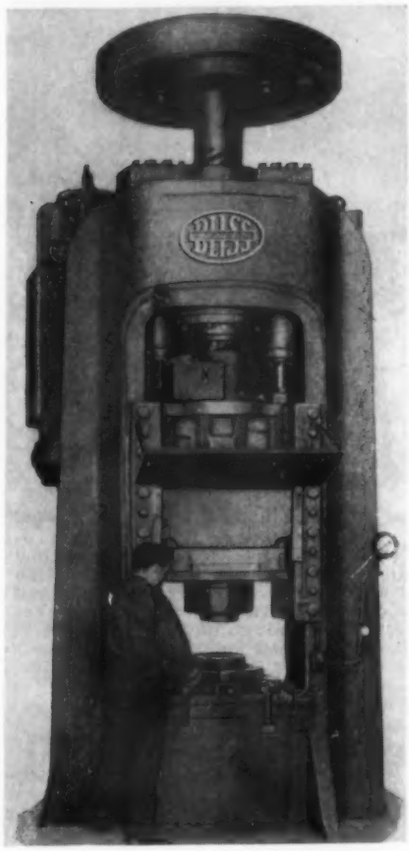


OVERLOAD PITMAN—*Dayton Rogers Mfg. Co., 2835 12th Ave., S., Minneapolis 7, Minn.* Model HC-1 hydraulic overload Pitman compensates for overloading on power press. Manufactured for presses from 30 to 500 ton, Pitman assures constant working pressure on work.

PRESS CONTROL—*The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* "Multi-Speed" control is now standard on all basic Multipress units. It provides rapid ram speed for approach and regulative speed for pressing.

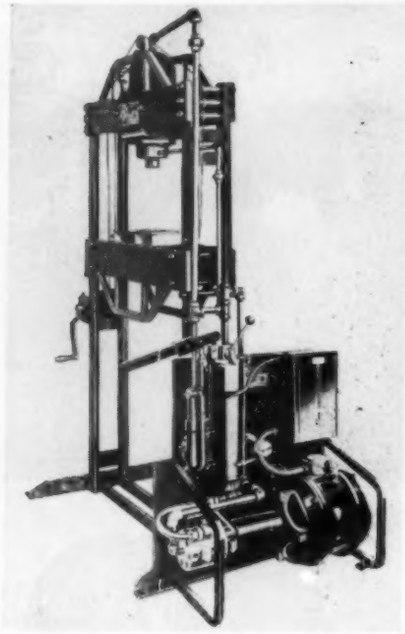
←

PUNCH PRESS—*Sales Service Machine Tool Co., Inc., 2363 University Ave., St. Paul 4, Minn.* A 30-ton open-back inclinable punch press is known as No. 3-30 Ton. A new-type clutch is a steel driving plate said to have sufficient engaging points to speed up clutch engagement. Standard stroke is 2½ in.



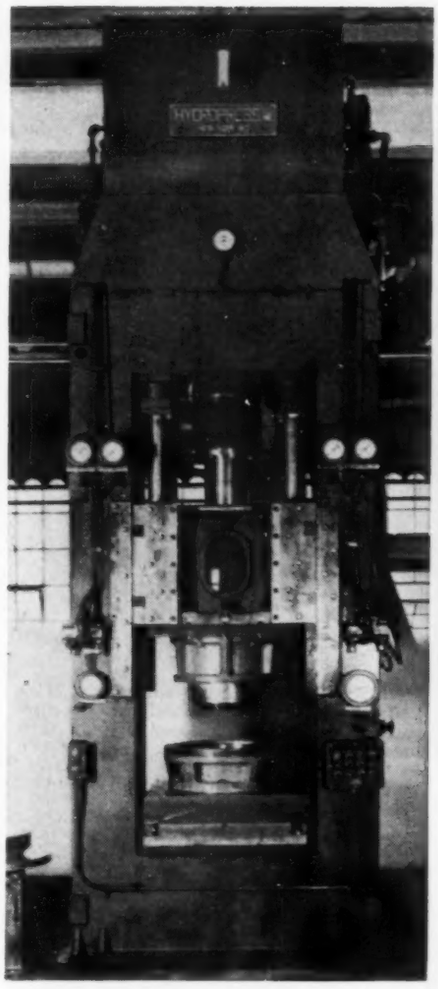
PRESS—*E. W. Bliss Co., Detroit 2, Mich.* The Hydro-Screw press comes in 400-, 600- and 1000-ton capacity and uses hydraulic pressure for moving the slide. It makes possible rapid production of hot forgings of steel, brass and aluminum in a wide range of shapes. It utilizes accumulated energy to deliver a quick, uniform blow. Power is adjusted by regulating variable delivery pumps.

HYDRAULIC PRESS—*Munton Mfg. Co., Franklin Park, Ill.* Hy-Speed hydraulic press, controlled by a two-pedal foot-power control, is in rated capacities of 10 and 25 tons. No outside airlines are required.

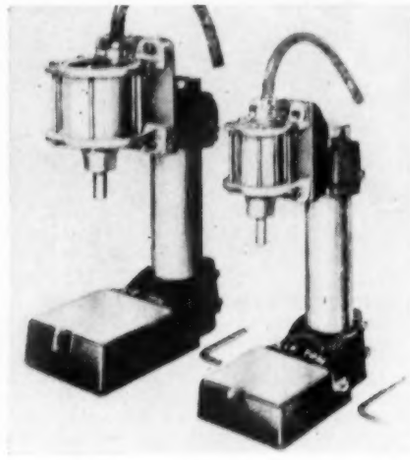


ARBOR PRESSES—*K. R. Wilson, Buffalo 2, N. Y.* A line of motor-driven hydraulic arbor presses is of 25-, 50-, 60-, and 75-ton capacity. The frame is a weldment, and press dimensions can thus be changed to meet special requirements at lower cost. Bed is raised or lowered by means of cable, drum and crank, and operation of ram is controlled by motor-valve control.

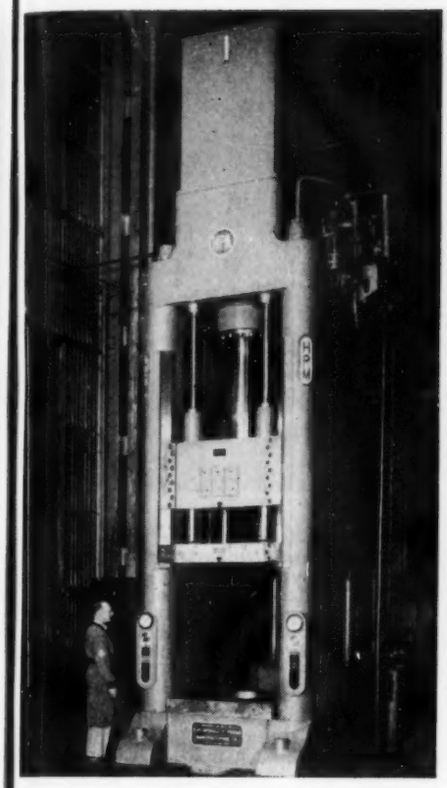
HYDRAULIC PRESS—*Acme Broach Corp., E. 3rd St., at Delaware, Lexington 17, Ky.* 6-ton hydraulic press can perform work of three different types of machines. With the standard worktable it serves as a hydraulic broaching or forcing press. Without table it serves as a horning press. With other tables it can be used as a straightening press. Stroke is variable to 24 in. Down speed is 26 fpm., and up speed is 36 fpm.



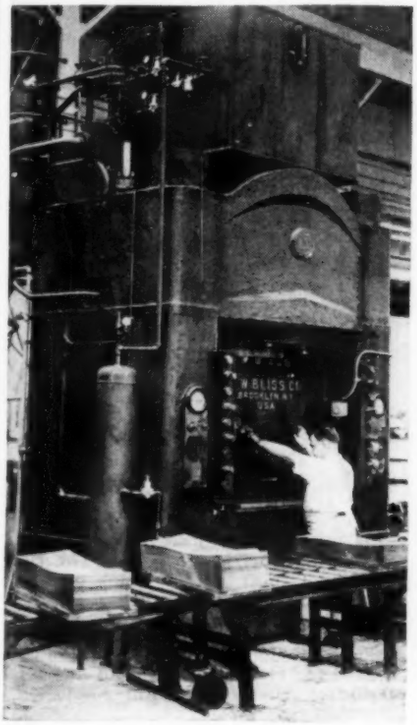
PRESS—*Hydropress, Inc., 570 Lexington Ave., New York 22, N. Y.* High-speed oil-hydraulic, double-action, deep-drawing press is self-contained and can have manual, semi-automatic, or automatic control. Main slide has a capacity of 100 ton while blankholder slide has a capacity of 50 ton. Slides can be coupled together for 150 ton.



ARBOR PRESSES—*Air-Trol, 2653 W. Lake St., Chicago 12, Ill.* Two air arbor presses combine features of arbor- and kick-type equipment. 72-lb. model delivers over ¾-ton squeeze at 150-lb. line pressure. 40-lb. model delivers approximately ¼ ton at same pressure. Squeeze is regulated by varying line pressure.

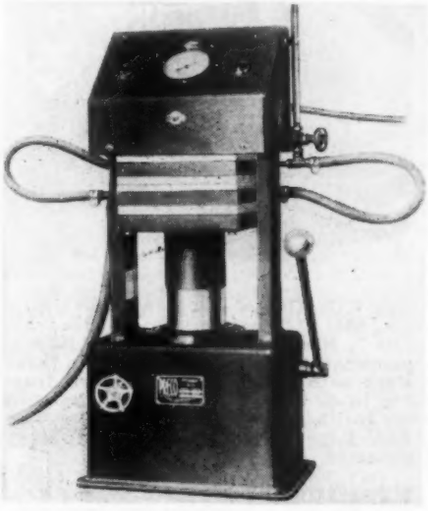


HYDRAULIC PRESS — *Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Self-contained 300-ton all-hydraulic press for exceptionally deep drawing has 118-in. opening, 54-in. stroke. Pressing surfaces are 48x48 in., and unit has 125-ton hydraulic blankholder and 84-ton die cushion in bed.



HYDRAULIC PRESS—*E. W. Bliss Co., 450 Amsterdam St., Detroit 2, Mich.* A 1500-ton single-action hydraulic press equipped with a 12-in. ram stroke and a hydraulic drawing cushion stroke of 6 in. Features include universal electric control to provide speed change and reversal.

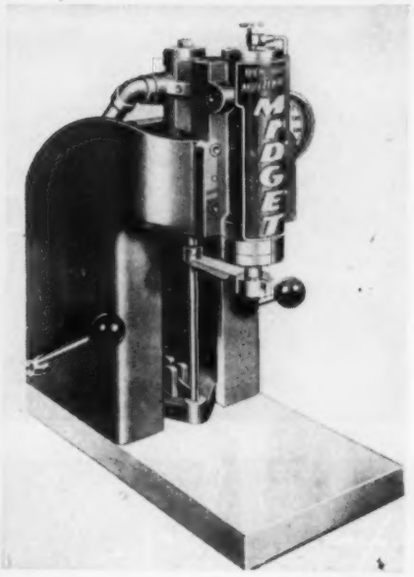
PRESS—*Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Hydraulic inclinable press called "Economy Press" is capable of 100 strokes per min., and has a pressure capacity to 50 ton. Working stroke is 4 in. It can be tilted 10, 20 or 30°, and can be operated semi- or full-automatic.



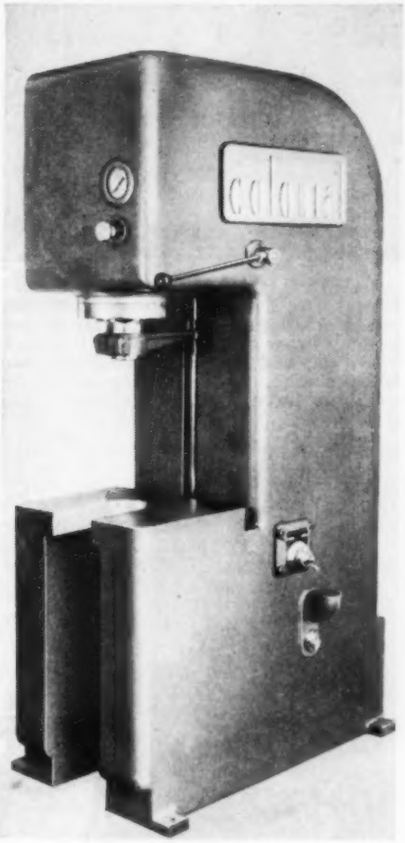
HYDRAULIC PRESS — *Preco Inc., 960 E. 61st St., Los Angeles 1, Cal.* Bench-type hydraulic press developing 40,000 lb. pressure has a two-stage hydraulic pump for high-speed and high-pressure strokes. Platens measure 8¾ x 12 in.

MULTIPRESS — *The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* The 75-ton Multipress, incorporates Vibratory Control, and gives pressure from 7½ to 75 ton. It has automatic or manual ram cycling. Stroke is 18 in. and daylight opening is 30 in.

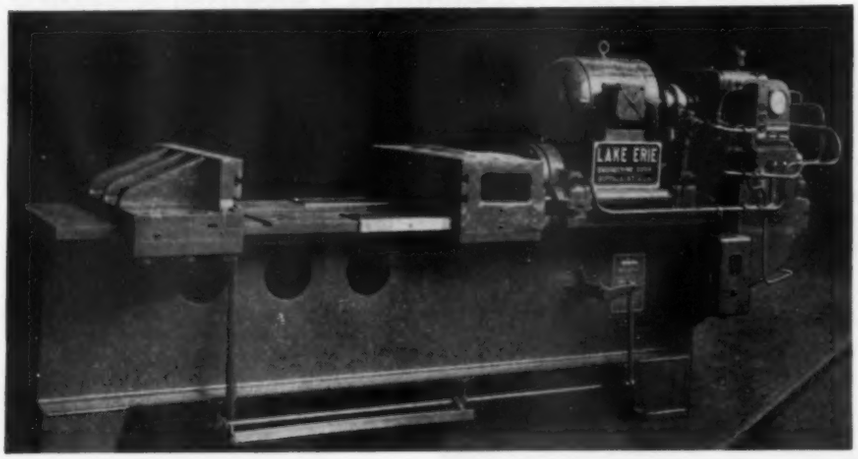
HYDRAULIC PRESS—*Dake Engine Co., Grand Haven, Mich.* The Model 25H hydraulic press is of 25-ton capacity. Work up to 33½-in. dia. can be handled between uprights.

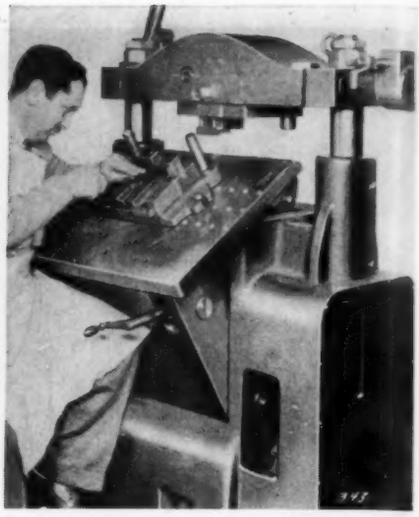


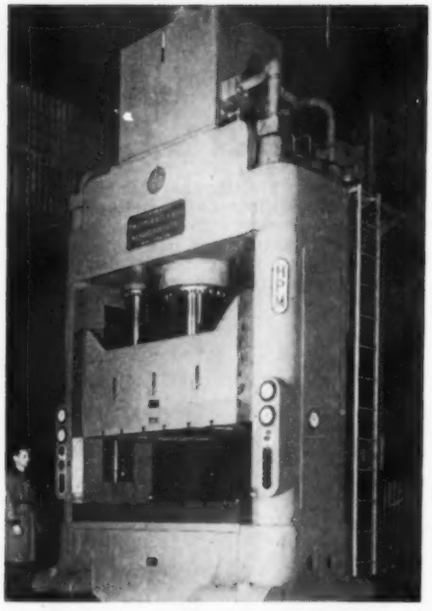
MULTIPRESS MIDGET—*The Denison Engineering Co., Columbus 16, Ohio.* The Multipress Midget, for pressing requirements between 200- and 2000-lb. ram effort, incorporates all control features of the larger units and is suited for multiple or "gang" installations and for successive operations.



ASSEMBLY PRESS—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* 10-ton model added to Series PA line of standard hydraulically operated assembly presses. The line now has five basic models with a range from 10 to 50 ton. The new unit has a 12-in. adjustable stroke. Power-stroke speed is 180 ipm., while return speed is 360 ipm.







DRAWING PRESS — *The Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* 500-ton Fastraverse sheet-metal press used to deep draw oblong shapes. Platen is 96x48 in., bed is 96x54. in. Press has 42-in. stroke. Three independent die cushions have 27x32-in. platens, 18-in. stroke.

BULLDOZERS—*Lake Erie Engineering Corp., Buffalo 17, N. Y.* Hydraulic bulldozers in a wide range of types and sizes for both standard and special applications are designed as compact, self-contained units which can be easily moved to new locations. They are built in horizontal and vertical models. The units are treadle operated.

DIE CUSHIONS—*Dayton Rogers Mfg. Co., 2835 12th Avenue South, Minneapolis 7, Minn.* Model K line of Hydropneumatic die cushions is built in three sizes with ring-holding pressure from 2½ to 55 ton. The units can be used on inclinable or straight-side presses and have 1- to 10-in. deep-drawing capacity.

HYDRAULIC PRESS—*Northern Tool and Machine Co., 1120 N. 31st Ave., Melrose Park, Ill.* A 20-ton gap-frame hydraulic press occupies 18x36-in. floor space, is self-contained and portable. Stroke of the press is 12 in. The platen is 12x17 in.

PRESS—*Hy-Air Products Co., Jackson, Mich.* The Hapco air-hydraulic press is available in 2½- or 5-ton models with 2- or 5-in. stroke. Air consumption is said to be reduced to approximately half the usual amount. Ram has full power on up stroke.

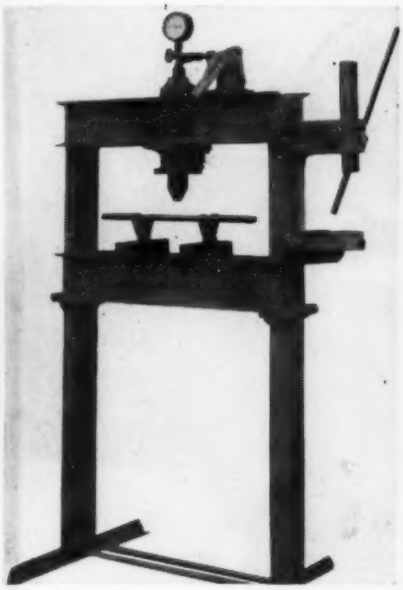
PRESS—*Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill.* 25-ton hydraulic straightening press is used in manufacture of crankshafts and other parts that are machined, heat-treated, and then ground. Parts are straightened after heat-treating, which is said ←to hold grinding to a minimum.

TRYOUT PRESS—*Alpha Tool Works, 6416 Beechton, Detroit 10, Mich.* The Model 40 tryout press is designed to try dies under actual production conditions and to speed up finishing. With 40-ton capacity, the press has 3¾-in. stroke, 100 strokes per min., 8-in. maximum and 6-in. minimum shut height, and 27-in. clearance between columns.

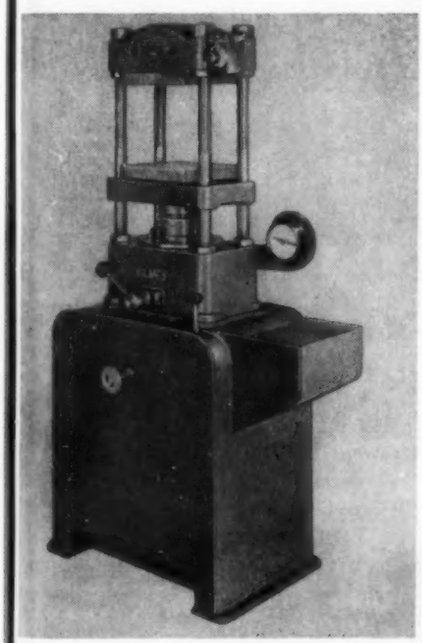
PRESSES—*Dake Engine Co., Grand Haven, Mich.* Air-operated press series available in 25, 50 and 75-ton capacities can be used wherever an air supply is available. They have either of two style pumps. One provides rated tonnage of press at 145-lb. air pressure; the other at 90-lb. air pressure.

HYDRAULIC UNIT—*Vulcan Tool Co., 730 Lorain Ave., Dayton 10, Ohio.* Unit pierces a total of 55 holes in four flanges of 8-ft. refrigerator door in single 7-sec. operation. Replaces four punch presses. Can accommodate other sizes of doors in change-over. Can be used for right- or left-hand doors by changing punches for hinge holes.

PRESS — *Air-Hydraulics, Inc., 401 Broadway, New York 13, N. Y.* 10-ton hydraulic arbor press is foot operated. Each stroke of the fast-speed center pedal moves ram ⅞ in. down to work. Right pedal moves ram down 1/16 in. with each stroke. Left pedal returns ram to original position. Unit delivers pressures to 20,000 lb.

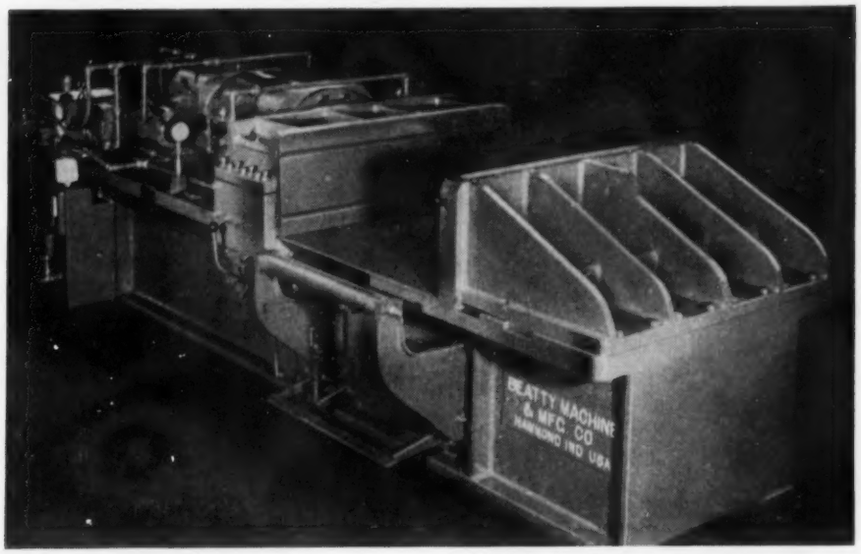


PRESS—*Manco Products Co., State & Hay Sts., York, Pa.* A hand-operated 25-ton hydraulic press is self-contained. Assembling, pressing, bending, broaching and other operations can be performed. Distance between uprights on the unit is 30 in.

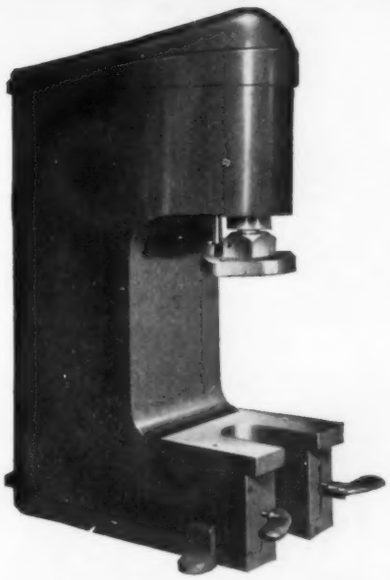


HYDRAULIC PRESS—*Elmes Engineering Works of American Steel Foundries, 1002 Fulton St., Chicago 7, Ill.* A line of hydraulic presses uses compressed air from the shop line for power. Designed for molding plastic and rubber, forcing, straightening, and testing, the presses are made in 20- and 30-ton bench and floor models, and in a 50-ton floor model.

PRESS—*Bryant Products Co., Dept. AM, Jackson, Mich.* An air-hydraulic press for light forming, riveting and assembling features controlled ram speed and pressure. Ram speed can be varied from 1 to 40 strokes per min. Solenoid valve provides for automatic operation and for control of length of stroke. Built in three sizes exerting 900, 2500, and 5000 lb. on downstroke. →



BULLDOZER—*Beatty Machine & Mfg. Co., Hammond, Ind.* A 400-ton model welded-steel horizontal hydraulic bulldozer is designed for heavy metalworking applications and features high operating speed in relation to its heavy size. Stroke is 24 in. Maximum opening is 60 in.



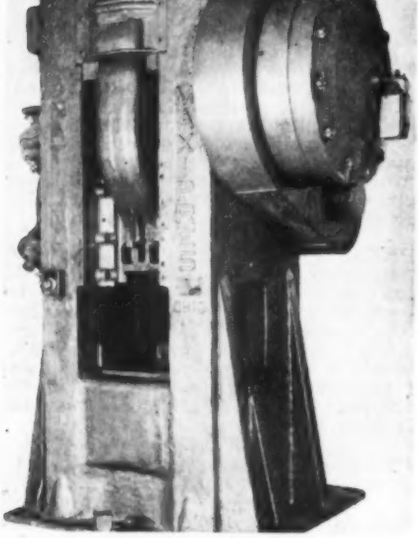
HYDRAULIC PRESS—*Bryant Products Co., Jackson, Mich.* A 5-ton air hydraulic press, equipped with four-way balanced valves, is designed for use on a bench. All working parts are contained in the housing.

PUMP—*Miller Hydraulic Engineering and Sales, 3615 Hart, Detroit 1½, Mich.* Single-acting manually-operated pump and hydraulic ram with control valve which permits lowering at any desired speed, regardless of position of operating handle. Three standard ram sizes have lifting capacities from 2210 to 8885 lb., based on 5000 psi.

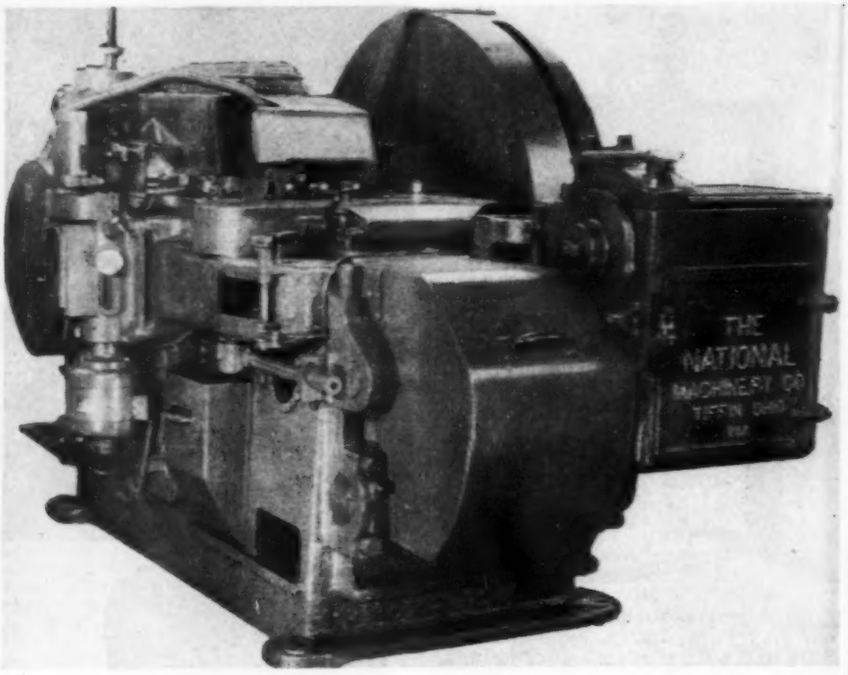
PRESS — *Air-Hydraulics, Inc., 401 Broadway, New York 13, N. Y.* A 6-ton capacity air-hydraulic press is used on metal, plastics and leathers for assembly, riveting, embossing, sizing and other operations. Ram pressure is adjustable from delicate pressures to 12,000 lb. Speed is up to 300 ipm., and stroke is adjustable from 1/16 to 5 in.

PRESS — *Air-Hydraulics, Inc., 401 Broadway, New York 13, N. Y.* Small air-hydraulic press with a capacity of 1200 lb. can be used for assembling, flanging, broaching, marking, riveting and similar operations. Unit has a 6-in. throat, 2½-in. stroke, ¾-in. ram and 5-in. square platen. Air inlet pressure is 100 lb.

DROP HAMMER—*Chambersburg Engineering Co., Chambersburg, Pa.* The Ceco-Drop, a gravity drop hammer in which steam or compressed air is used to lift the ram, is said to deliver 10 to 20% more blows in a given time than a board drop hammer of equal size. It will be in sizes from 50 to 20,000 lb. On the 2,000 lb. Ceco-Drop there are 22% fewer parts.



FORGING PRESS—*National Machinery Co., Tiffin, Ohio.* Maxipres (No. 1½ is illustrated) has design improvements.

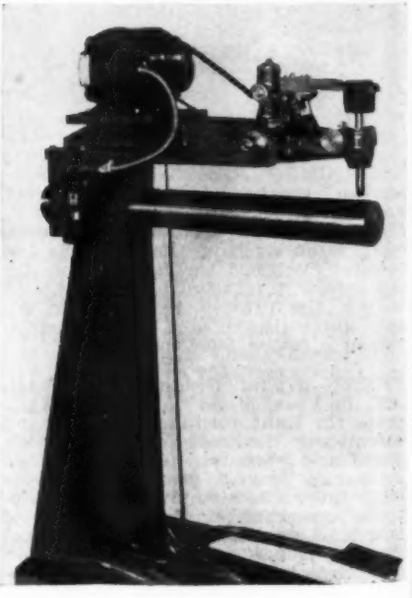


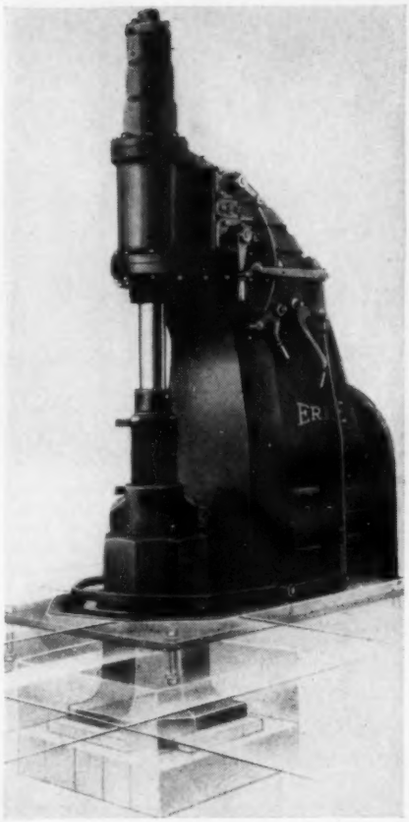
BOLTMAKER — *National Machinery Co., Tiffin, Ohio.* Boltmaker produces ⅜-in. hexagon-head capscrews to Class III fit at 85 per min. Wire is fed into machine automatically. Operations of cutting off, extruding, heading, trimming, pointing and roll-threading are accomplished simultaneously.

FORGING PRESS—*Ajax Manufacturing Co., Cleveland 17, Ohio.* 500-ton forging press can be operated at 90 strokes per min. Air clutch mounted directly on the main eccentric shaft of the press has inter-connecting control with the brake, so brake is applied the instant that clutch is released.

HAMMER—*The High Speed Hammer Co., Inc., 313 Norton St., Rochester 5, N. Y.* Riveting hammer has 24-in. long steel arbor, is suited for sheet-metal work, and takes ⅛- to ¼-in. dia. rivets. Other capacities are available. →

COLD HEADER—*National Machinery Co., Tiffin, Ohio.* ¼-in. double-stroke, solid-die cold header illustrated is tooled for production of Phillips screws.

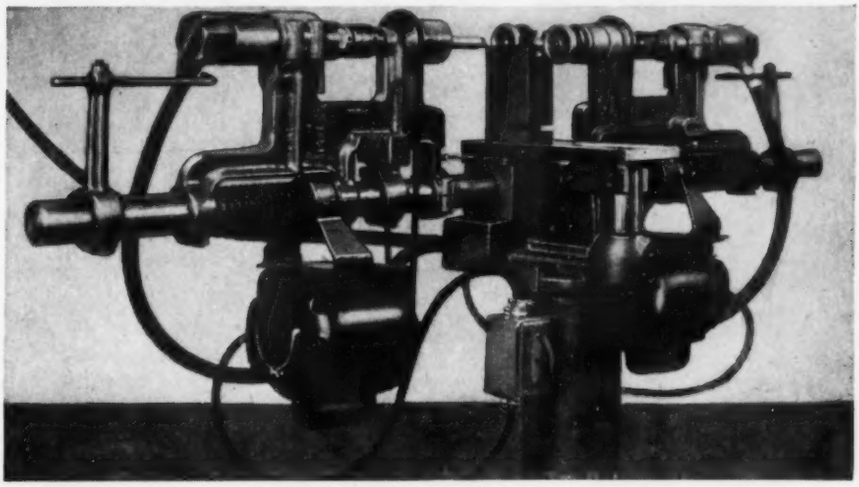




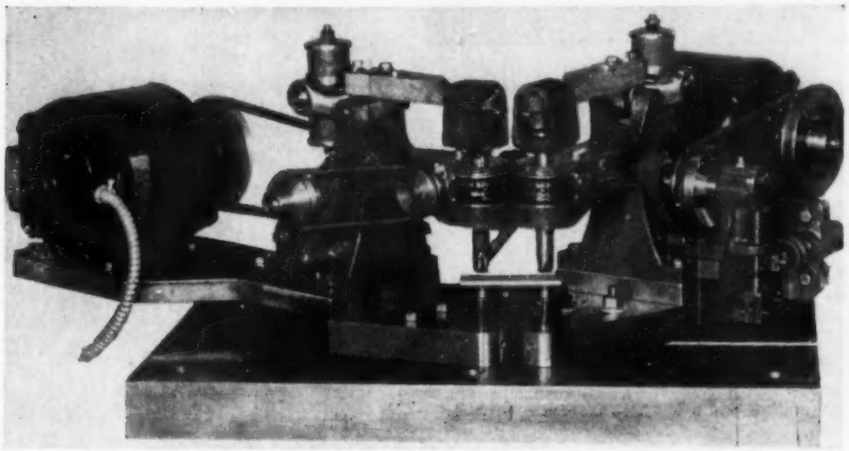
PNEUMATIC HAMMERS—*Erie Foundry Co., Erie, Pa.* A line of pneumatic hammers has moving weights from 200 to 3000 lb. with motors from 10 to 150 hp. The number of blows per minute varies from 200 in the smallest hammer to 85 in the largest. Control is by either treadle or lever. Lengths of stroke vary from 14 to 38 in., and total height above the floor varies from 90 to 197 in.

NUT FORMER—*National Machinery Company, Tiffin, Ohio.* Cold nut former of 5/16-in. size produces single chamfered, washer-faced nuts and other standard and special nuts from round stock fed into machine from a coil. Finished nut, ready for tapping, is produced on each stroke.

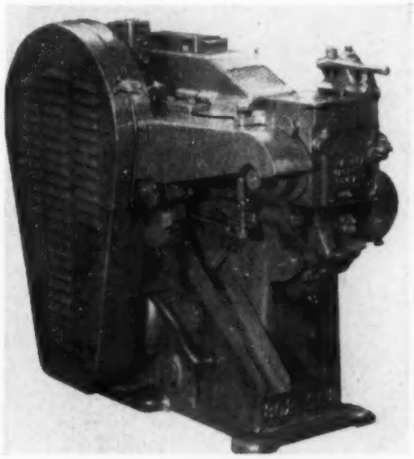
RIVETER — *Hannifin Corp., 1101 S. Kilbourn Ave, Chicago 24, Ill.* Portable 35-ton hydraulic riveter is a yoke-type unit for cold or hot riveting work on automobile frames, structural steel.



RIVETER—*Lemert Engineering Co., 1200 N. Western Ave., Plymouth, Ind.* Horizontal double-end Airflex riveter, utilizing the principle of rotating impact, is used for riveting wheels on the axle of any wheeled toy, for simultaneously heading both ends of a tie rod, and for similar operations.

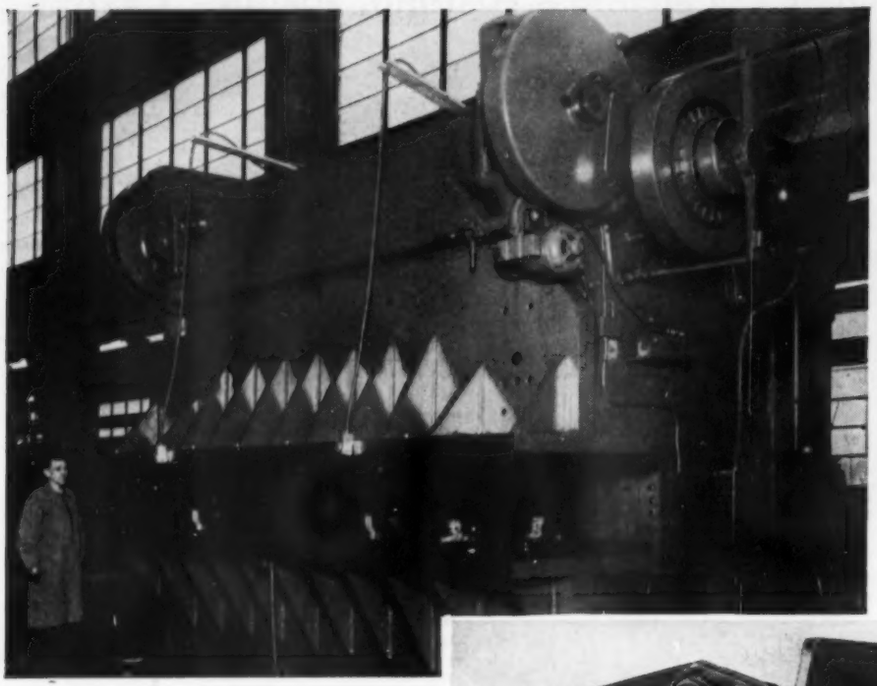


RIVETING UNIT—*The High Speed Hammer Co., Inc., 313 Norton St., Rochester 5, N. Y.* 2AHD bench-type hammer has two heads, forms two rivet heads simultaneously. Minimum center-line distance is 2¾ in., maximum is 12 in. Capacity is ⅛- to 5/32-in. dia. rivet. Different types of units can be fabricated.

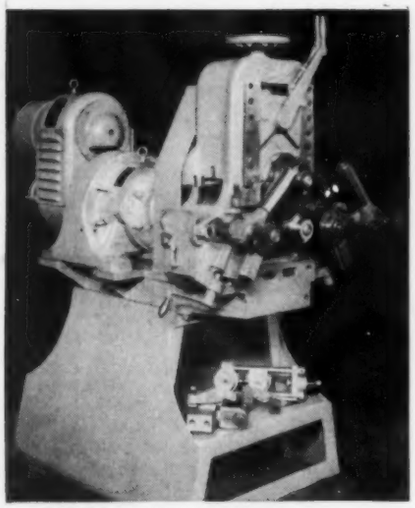


RIVET HEADER—*National Machinery Co., Tiffin, Ohio.* 3/16-in. automatic hollow-rivet header on which rivets produced are pierced, rather than drilled.

RIVET-SPINNING MACHINE — *The Grant Mfg. & Machine Co., Bridgeport 5, Conn.* Model No. 367 Noiseless rivet-spinning machine designed for jobs requiring large throat depth, will form heads on rivets from the smallest size to ¼-in. dia. when properly tooled. Depth of throat available is 36 in.



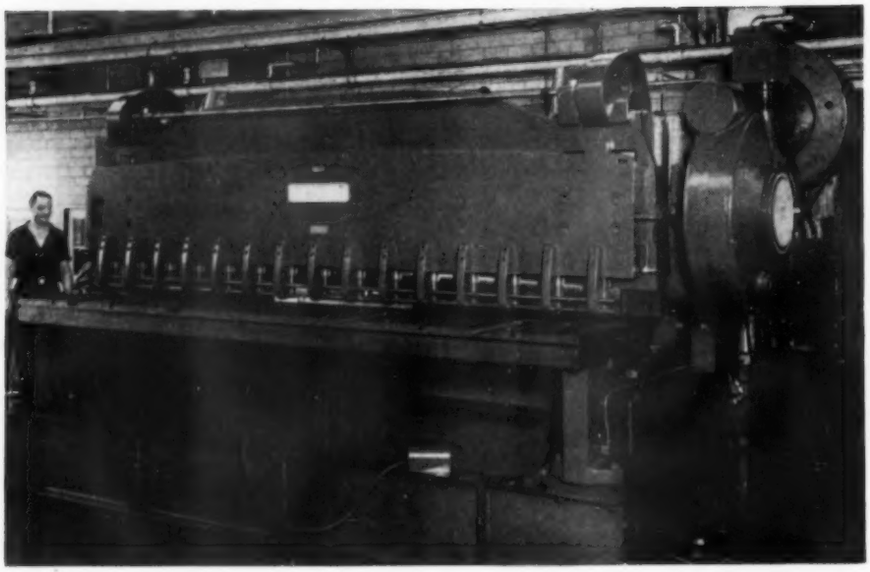
PRESS BRAKE — *Cincinnati Shaper Co., Hopple, Garrard and Elam Sts., Cincinnati, Ohio.* The permanent wide ram of the machine above makes it unsuitable for bending. It is furnished with various combinations of foot switches and palm buttons. Other models have narrow nose.



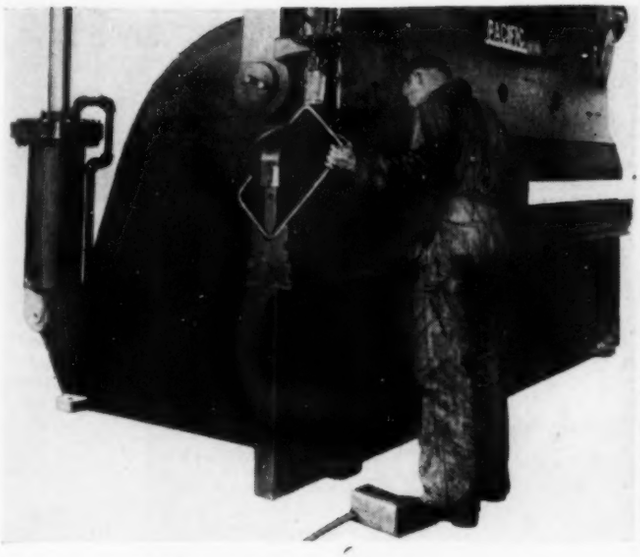
BENDING ROLL—*Buffalo Forge Co., Buffalo 5, N. Y.* Bending roll, No. OA, for bending light sections into arcs, spirals, or circles, is fitted with variable-speed drive.

PRESS BRAKE — *Pacific Industrial Mfg. Co., 848 49th Ave., Oakland, Calif.* Hydraulic press brake, Model 150 handles up to ¼ in. by 10 ft. Throat depth on standard models is 8 in. Maximum pressure is obtainable at any position in stroke, and the ram can be stopped and returned or re-started at any point. →

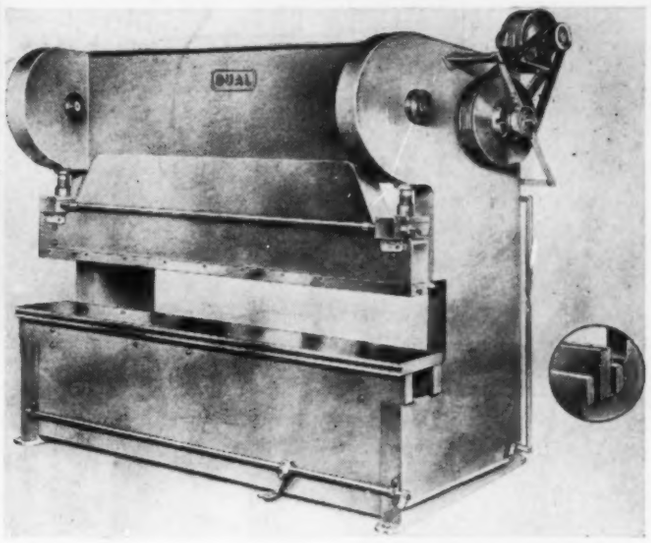
SHEET SUPPORT—*Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati, Ohio.* Magnetic sheet support is available for squaring shears, has Alnico permanent magnets mounted in holes of channels under back brace. These hold the sheet flat so it can be gaged against back gage stop. ↓



ROD PARTER — *O'Neil-Irwin Mfg. Co., 311 Eighth Ave., Lake City, Minn.* Di-Acro rod parter is made in two sizes with capacities of ⅜- and ⅝-in.

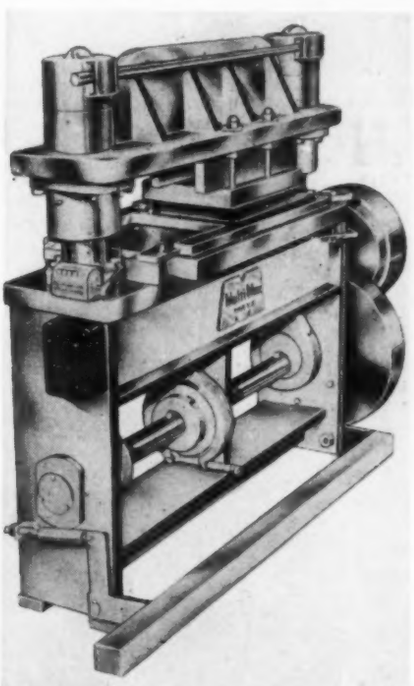


PRESS BRAKE — *Pacific Industrial Mfg. Co., Oakland, Calif.* A dual-cylinder hydraulically operated press brake for forming, punching or shearing heavy plate is made in 12- and 14-ft. ram lengths, each model with capacity of 375 tons. Full pressure is available at any point in stroke, and stroke length is variable to 6-in.

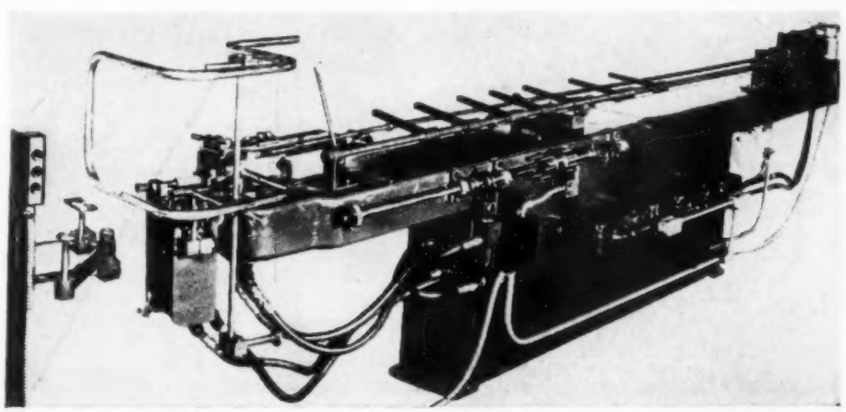


POWER SHEARS—*Parker Manufacturing Co., 2200 Colorado Ave., Santa Monica, Calif.* A line of all-steel power squaring shears has capacities to 14 gage. Shears stand only 47 in. high, have 73-in. cutting length, 2-hp. motor, and operate at 85 strokes per min.

PRESS BRAKE—*Dual Press Co., St. Louis 18, Mo.* Series 25 press brake has all-steel completely welded construction. The 25-5 model has a forming capacity in mild steel of 12 gage, 4 ft. Length of ram is 60 in. The 25-6 model has a capacity of 14 gage, 6 ft. Ram length is 72 in. Both units give 35 strokes per min.

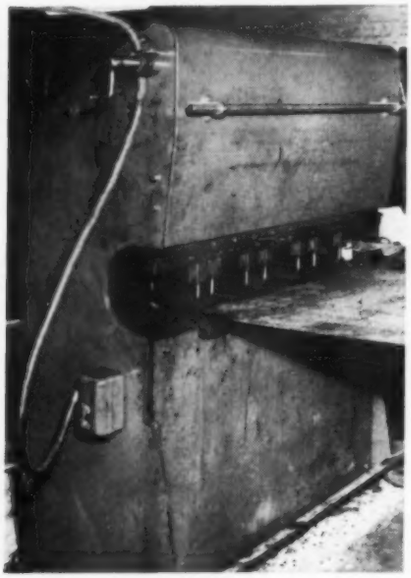


PRESS—*Parker Mfg. Co., 2200 Colorado Ave., Santa Monica, Calif.* A 30-ton combination shear and press, the Multi-Max shears, blanks, notches, punches, perforates, slots, bends and forms sheet-metal parts in single or multiple units. Machine requires 36x75-in. floor space. Motor is capable of 100 strokes per min. Bed die space is 12x36 in.

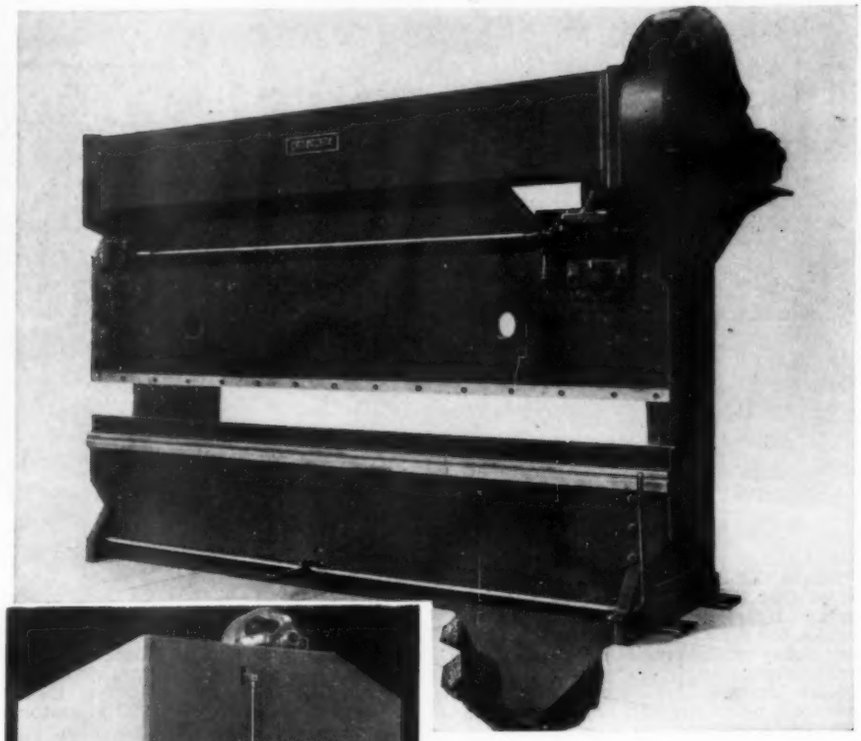


BENDING MACHINE—*Pines Engineering Co., Inc., 601 Walnut St., Aurora, Ill.* Improved line of bending machine ranges up to size for 6-in. extra-heavy pipe. Adjustments permit single duplication of a series of bends on each piece. Scratching of polished work is said to be eliminated.

SQUARING SHEAR — *Parker Mfg. Co., 2200 Colorado Ave., Santa Monica, Calif.* A 10-gage power squaring shear is powered by 5-hp. motor and gives 85 strokes per min. Four-edged tool-steel blades are standard equipment. Cutting length is 73 in.

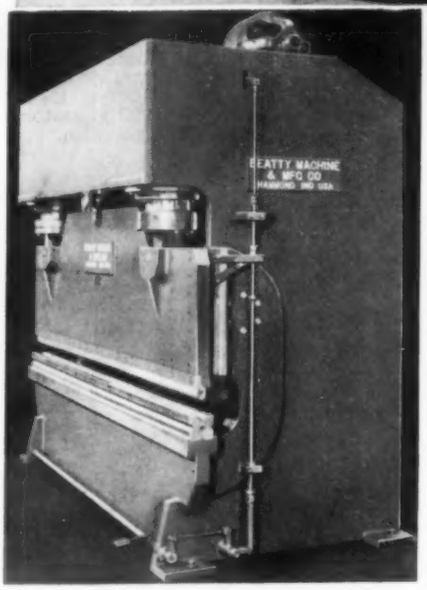


PRESS BRAKE—*Lynn Mfg. Co., 1121 S. 7th St., Minneapolis 4, Minn.* A hydraulic steel press brake with 4-in. stroke can give any stroke to 2¾ in. by means of a stroke-adjustment pin. Bending capacity in mild steel is 56 in. for No. 14 gage over ⅝-in. V die. Hydraulic foot control permits 15 to 50 strokes per min.

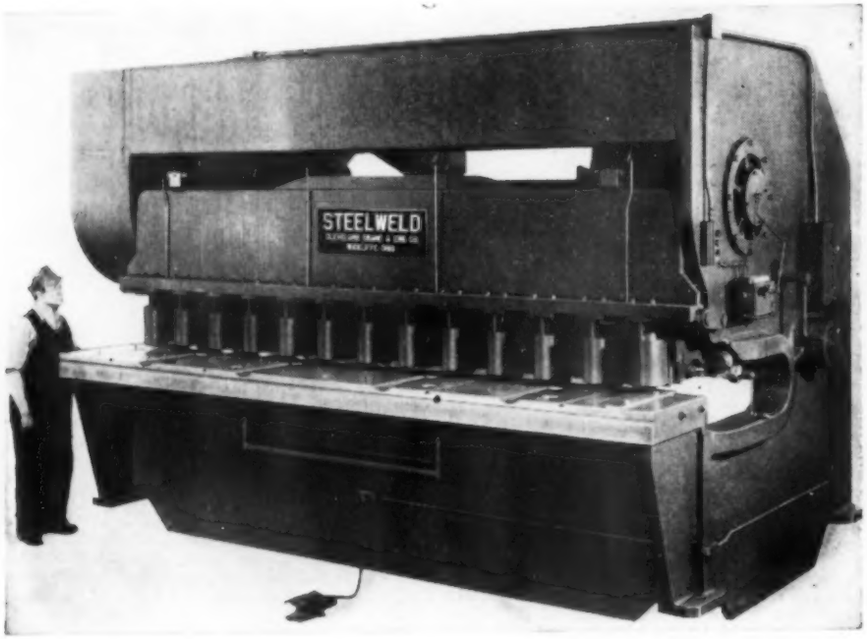


PRESS BRAKE—*Columbia Machinery and Engineering Corp., Hamilton, Ohio.* Power press brake has motor-driven slide adjustment that can be adjusted out of parallel with base. Amount of adjustment is shown on indicators at each end of unit. Capacity is 120 tons. Unit operates at 30 strokes per min.

PRESS BRAKE—*Beatty Machine & Mfg. Co., 940 150th St., Hammond, Ind.* Model No. 300 hydraulic press brake has 300-ton capacity, is also made in capacities from 200 to 600 tons with distance between housings ranging from 8½ to 12½ ft. Stroke-control features permit operation in any portion of the stroke. →

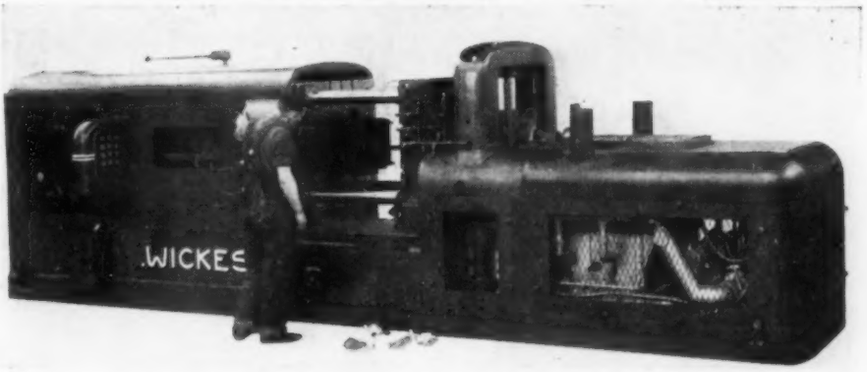


SHEAR—*The Cleveland Crane and Engineering Co., Wickliffe, Ohio.* A Steelweld pivoted-blade shear can cut 12 feet of ¾-in. steel plate at a rate of 30 strokes per min. Throat depth is 36 in., permitting the slitting of very wide plate. ↓

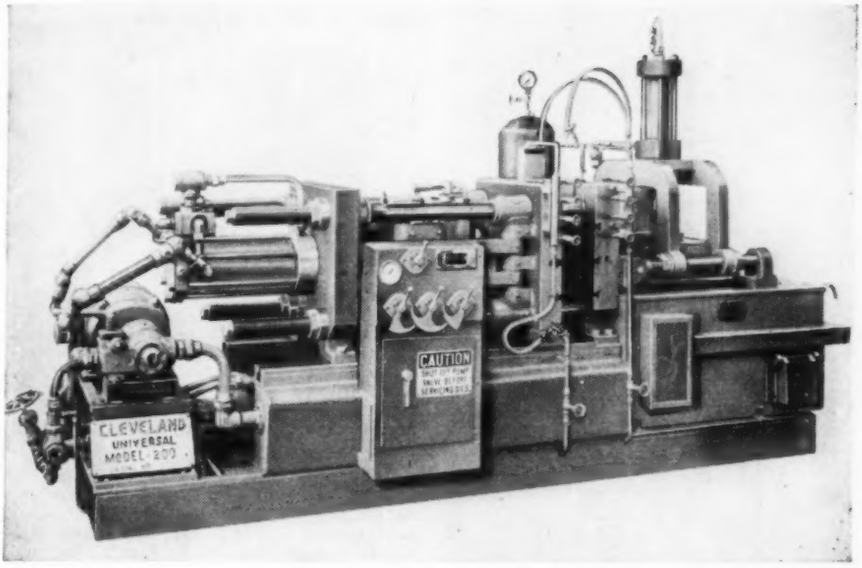


SHEARS—*Cleveland Crane & Engineering Co., Wickliffe, Ohio.* Steelweld shears have an electric foot control connected to an outlet at the front of the machine by heavy cable. It can be slipped to the most convenient spot for a particular job.

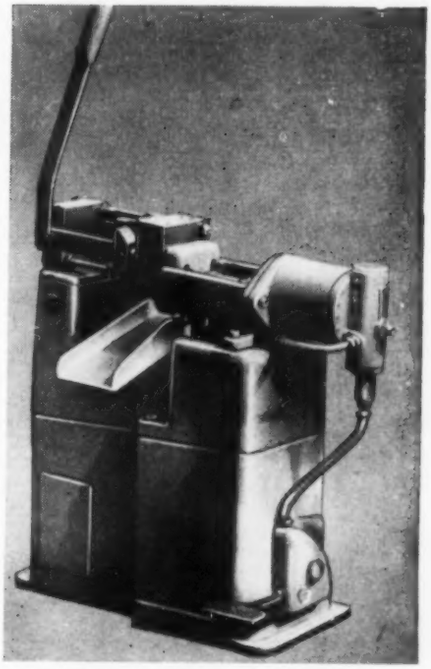
DIE-CASTER—*Wickes Brothers, Saginaw, Mich.* The number 4 automatic die-casting machine with cycle initiated by electric pushbutton, casts zinc, tin and lead and has up to 100 cu. in. injection capacity. Any single part of the cycle can be operated manually.→

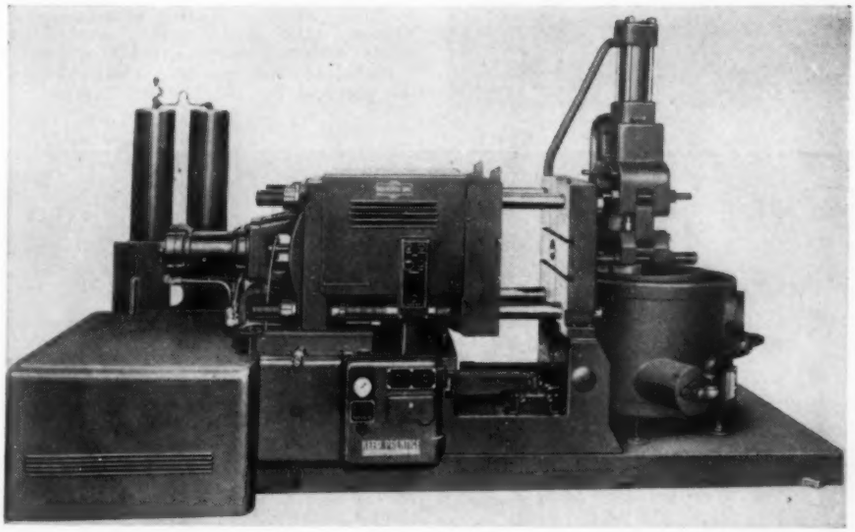


DIE-CASTING—*Cleveland Automatic Machine Co., 4932 Beech St., Norwood, Cincinnati 12, Ohio.* Hydraulic die-casting machine, Model 200 high-pressure, is capable of locking dies with tremendous pressure to produce castings with minimum flash. Features include automatic timing combined with selective manual control. ↓



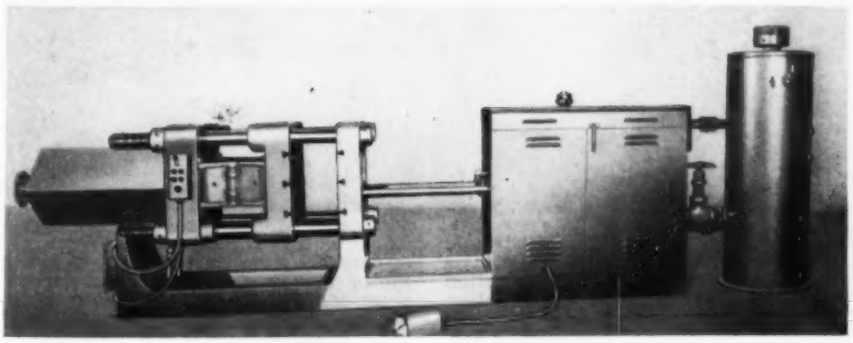
DIE CASTER—*H. L. Harvill Mfg. Co., Corona, Cal.* The HD103 high-speed cold-chamber injection-type die-casting machine has center gate for cold-chamber casting of aluminum, magnesium and brass alloys. Provision is made for conversion to hot-chamber operation. Capacity is 2.6 lb. of aluminum. Maximum rate is 500 casting cycles per hr.



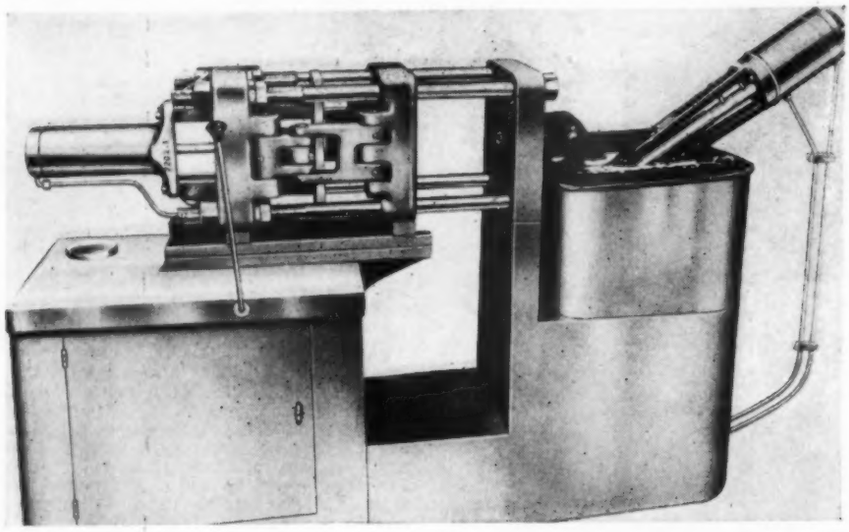


CAST ALUMINUM — *DCMT Sales Corp., 315 Broadway, New York 7, N. Y.* Aluminum is cast in this 3-oz. cold-chamber pressure die-casting machine. It injects metal under high pressure.

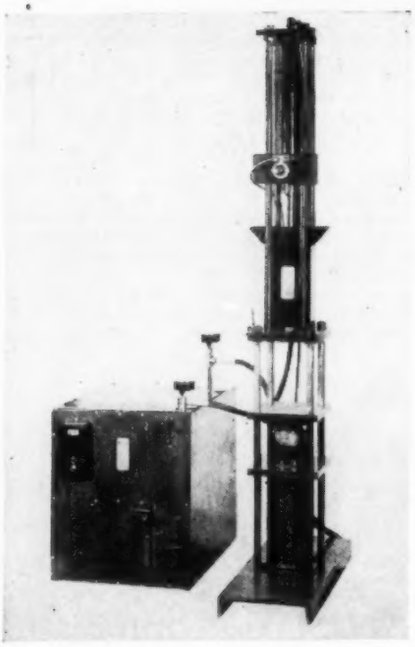
←
DIE-CASTING—*Reed-Prentice Corp., Worcester 4, Mass.* Machine, No. 2, casts to 16 lb. of zinc at 1400 psi. Operation is manual or semi-automatic; when semi-automatic, dies are closed manually by pushbuttons and rest of cycle is automatic.



DIE-CASTING UNIT—*H. L. Harvill Mfg. Co., Corona, Calif.* The Model HD-302 hydraulically operated die-casting machine is a heavy-duty type, and can be converted from normal cold-chamber operation to optional hot-chamber operation. Metal is injected into die cavities under pressure from 3400 to 11,800 psi. Capacity is 11.6-lb. of aluminum alloy or equivalent volume of other materials. ←

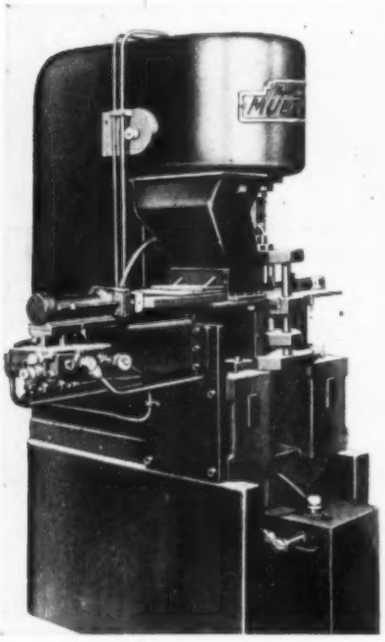


HOT-CHAMBER MACHINE—*Production Engineering Consultants, Los Angeles 16, Calif.* Hydraulic hot-chamber machine embodies cold-chamber injection pressure for a 2-lb. shot, either center gated or 3 in. below. It is 10x10 in. between bars, will take die thicknesses from 6 to 11 in. with die halves separating 6 in.



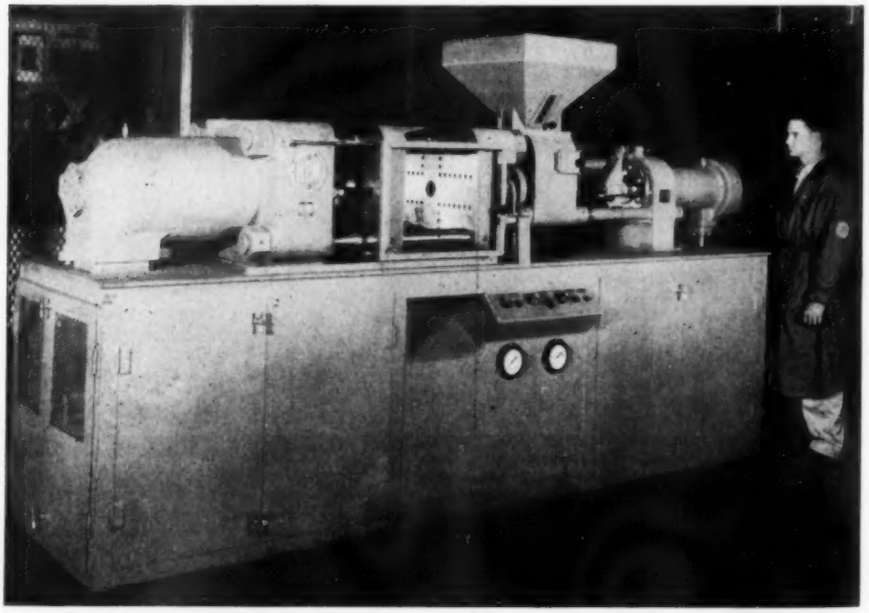
INJECTION-MOLDING PRESS — *Munton Mfg. Co., 9400 Belmont Ave., Franklin Park, Ill.* Motorized hydraulic press has 3-oz. capacity, 50,000-lb. clamping pressure. Injection pressure is 12,000 psi., operating cycle is 30 sec., and maximum mold opening is 12 in.

SHEET-PLASTIC CREASER—*Taber Instrument Corp., 111 Goundry St., North Tonawanda, N. Y.* Hand-fed foot-operated Thermocreaser produces 90° creases or folds on 5-20 pt. plastic up to 30 in. wide. Creasing is done by a heated, thermostatically controlled blade which presses sheet stock into a metal folding die or a resilient-rubber pad.



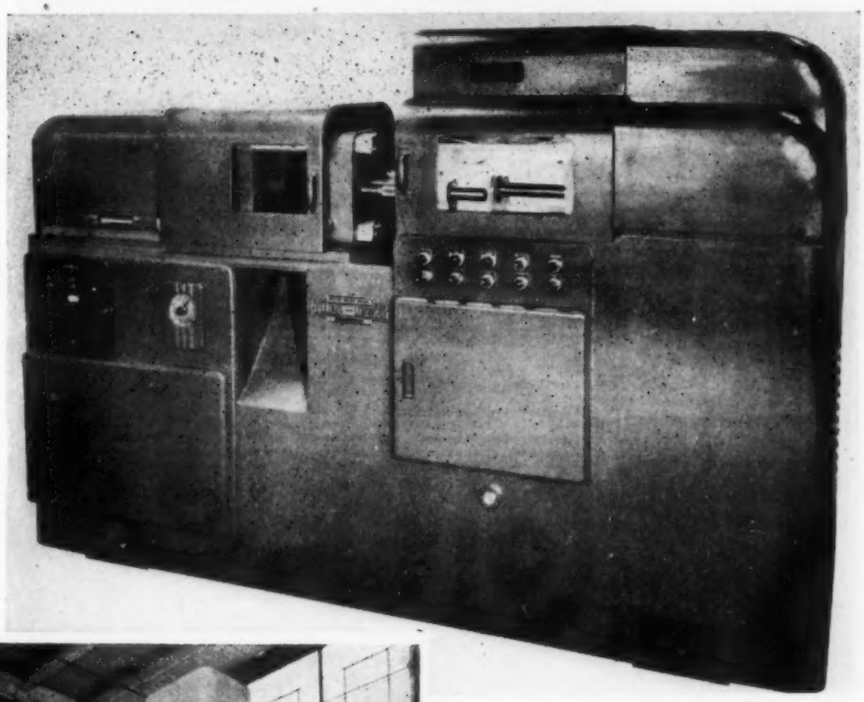
PELLETING MULTIPRESS — *Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* Automatic pelleting Multipress will process powdered or granular forms of ceramics, chemicals, plastics or metals. Press features independent control of charging, compacting and ejecting ram actions.

DIE-CASTING MACHINE—*Robert A. Cox Co., is distributed by Ermac Co., 1426 S. Santa Fe Ave., Los Angeles 21, Calif.* The "Hot-Shot" die-casting machine is self-contained, air-operated unit, and designed for intermittent-production die-casting work. The goose-neck type machine measures 22x72x40 in. high, has 11x16-in. die capacity and 7-in. die stroke. The holding pot has a capacity for 300 lb. of zinc alloy. Maximum casting capacity is 1½ lb.



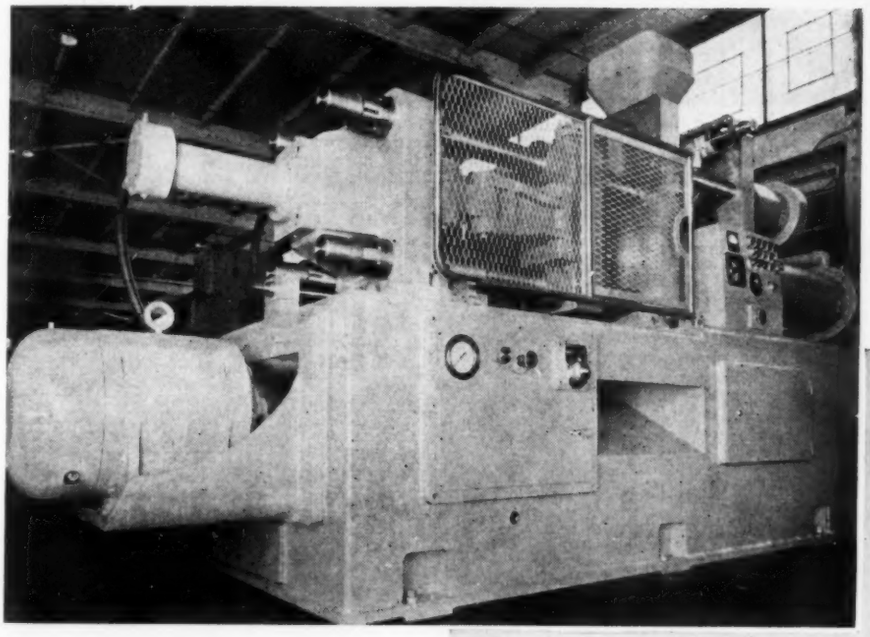
PLASTICS MOLDER—*The Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* The Model 125-H-4, a 4-oz. plastics-injection machine, has simplified construction and is more powerful and faster-acting than the earlier model. A self-contained power system is in the base. It is driven by a direct-connected 15-hp. motor and provides a working pressure of 2250 psi. The gravity feed system utilizes a 50-lb. capacity lightweight hopper.

INJECTION MOLDER — *Moslo Machinery Co., 2443 Prospect Ave., Cleveland 15, Ohio.* The Minojector ¾-oz. capacity plastics injection-molding machine is designed for short-run jobs such as production of color chips and samples, custom moldings and mold test runs. Standard die size is 4½x2x2⅝ in., but lengths can be varied for odd-shape parts.



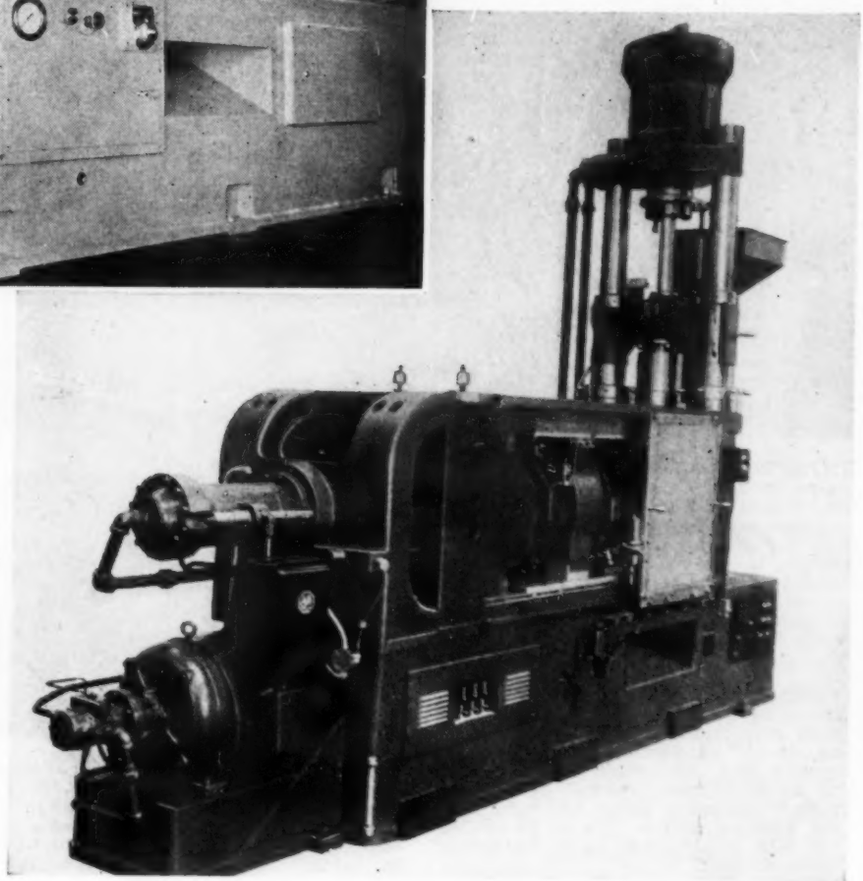
INJECTION PRESS—*Ferracute Machine Co., Bridgeton, N. J.* 1-oz. injection press, the Versa Mold Press, is used in molding nylon, Lucite, Plexiglas, polystyrene and other thermoplastics. It is an air-actuated ram press capable of exerting a ram pressure of 8,000 lb. at 80-lb. line pressure.

MOLDING PRESSES—*Baldwin Locomotive Works, Philadelphia 42, Pa.* A standard line of Southwark Hy-Speed universal plunger-molding presses permits thermo-setting resins or soft rubber to be injected into a mold and rapidly cured. Standard models have capacities of 50, 100, 200, and 300 ton. Die space is from 21x20 to 36x36 in.

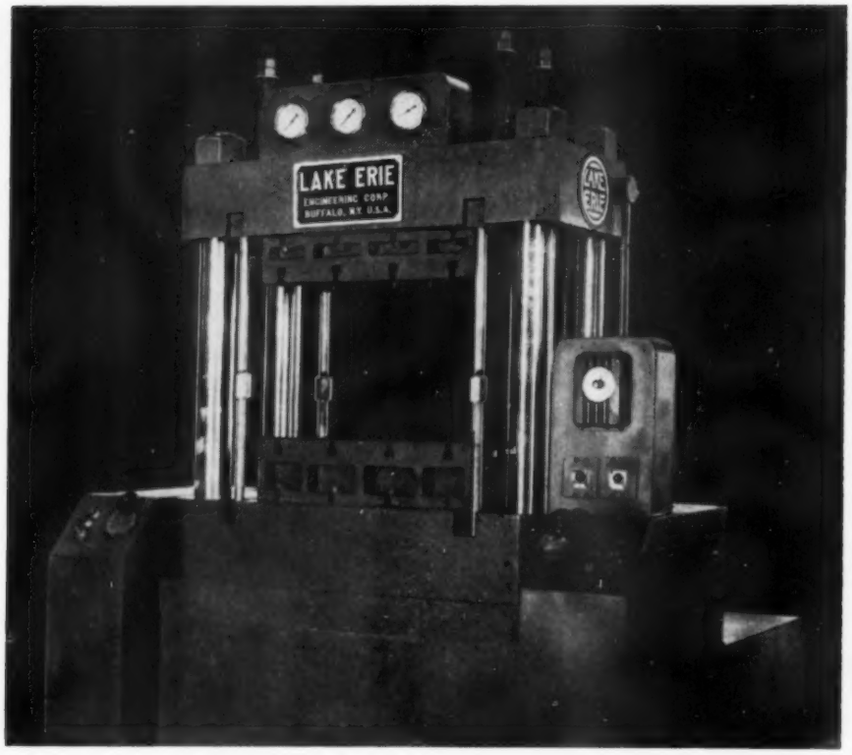


INJECTION MOLDER—*Plastics Div., The Fellows Gear Shaper Co., Springfield, Vt.* The Fellows-Leominster 1B-2 plastics injection-molding machine with a molding capacity of 2 oz. per shot, has a speed up to 6 shots per min., depending on product and mold design. Plasticizing capacity is 45 lb. per hr.

MOLDING MACHINE—*Rockford Machine Tool Co., Rockford, Ill.* Thermosetting materials are preformed, preheated and molded in one operation in the Hy-Jector. All movements are hydraulically powered, electrically controlled and automatically timed throughout cycle.

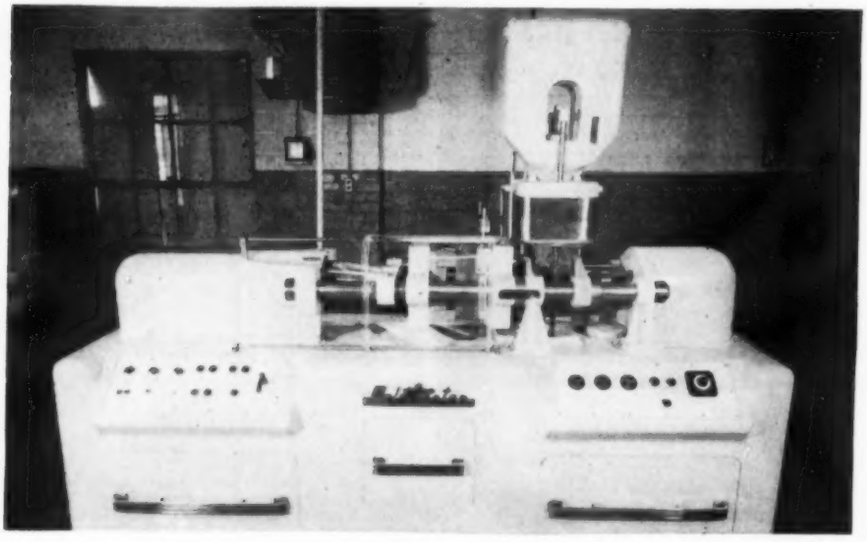


MOLDING MACHINE—*Lester-Phoenix, Inc., 2711 Church, Cleveland, Ohio.* Plastics injection machine can mold 32-oz. pieces over 150 sq.in. projected area. Injection pressure is 27,000 psi, with 600-ton mold-locking pressure. Injection cylinder is vertical, and injection speed and pressure are separately controlled. →

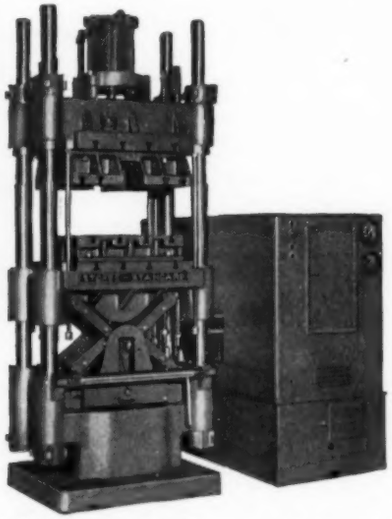


MOLDER — *Lake Erie Engineering Corp., Buffalo 17, N. Y.* A press for duplex or compression molding said to save 20 to 30% molding time, has an upstroke duplex ram mounted inside the main ram. A jack ram provides rapid approach stroke. The unit is self-contained, single action and semi-automatic. The main ram has 200-ton capacity with 20-ton pullback.

PLASTICS PRESS—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* A vertical plastics-injection press incorporating a single hydraulic cylinder, provides for clamping the mold halves together and injecting the plastic material into the mold cavity in the same stroke of the piston rod.

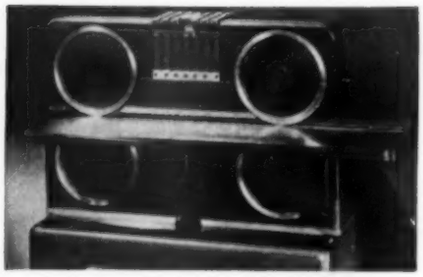


INJECTION MOLDER — *Crown Machine & Tool Co., 2800 W. Lancaster, Ft. Worth 7, Tex.* The Crown Moldmaster, an automatic injection-molding machine for all thermoplastic materials, is self-contained, hydraulically operated, and pushbutton electronically controlled. Manual, semi-automatic or automatic cycles are as short as 20 sec. Platen area is 12x12 in.



PLUNGER PRESS—*F. J. Stokes Machine Co., Philadelphia 20, Pa.* 150-ton plunger press utilizes "Standard" toggle action to lock mold shut. Press can be loaded with die open or closed. Operation can be manual or semi-automatic.

PRESS—*Kux Machine Co., 3940 W. Harrison St., Chicago 24, Ill.* No. 67 high bulk-factor preform press is designed for production of preforms or tablets from materials which cannot be automatically tableted because of high compression ratios and poor feeding characteristics. Up to 20 tablets per min. can be formed in automatic cycle of unit.



THERMOBEADER — *Taber Instrument Corp., North Tonawanda, N. Y.* Used for straight-edge beading of thermoplastic-type sheet stock, die-cut blanks and strips from 0.005 to 0.020 in. thick.

POWDER-METALS PRESS — *F. J. Stokes Machine Co., Philadelphia 29, Pa.* The S-3 powder-metals press has 40-ton capacity and operates at speeds to 30 strokes per min. It is an automatic unit in which independent cams control synchronized movements of both upper and lower punches. Max. die fill is 6¼ in. and max. diameter that can be pressed is 3 in.

Welding and Heat-treating

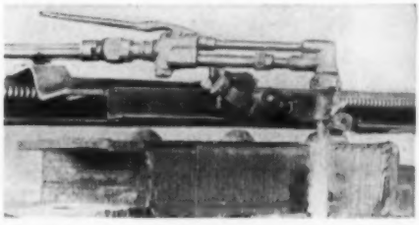
AMERICAN MACHINIST 35th ANNUAL REVIEW

WELDER—*The Hobart Brothers Co., Hobart Square, Troy, Ohio.* Model T1H-300-s ac. welder, for use with Heliarc equipment as supplied by The Linde Air Products Co., uses helium or argon for inert-gas-shielded welding. Can be used for welding magnesium alloys, aluminum, high-carbon and other alloy steels, brass and other metals.

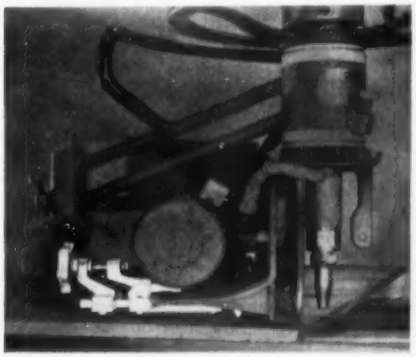
BLOWPIPE—*Weldit, Inc., 990 Oakman Blvd., Detroit, Mich.* Gas-air blowpipe for use with manufactured or natural gas, propane and compressed air, listed as Weldimatic Model C-47, is used for heating, annealing or soldering operations. Blowpipe automatically reduces flame to small pilot light during idle moments.

POWDER CUTTING—*The Linde Air Products Co., Unit of Union Carbide & Carbon Corp., 30 E. 42d St., New York 17, N. Y.* Oxweld AC-4 powder-cutting blowpipe cuts oxidation-resistant materials such as stainless steels. ACA-2 attachment is for shape cutting with Oxweld C-39 machine-cutting blowpipe.

"HELIARC" TORCH—*The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42d St., New York 17, N. Y.* The HW-4 "Heliarc" torch for inert-gas shielded arc welding employs a ceramic gas cup to prevent arcing to adjacent areas and to shield the weld area. Monel, aluminum, magnesium and stainless steel are welded without the use of flux.

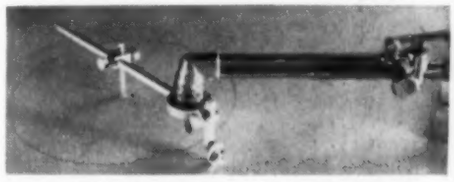


SCREW FEED—*J. A. Campbell Co., 645 E. Wardlow Rd., Long Beach 7, Calif.* Screw-feed device is said to make grinding and milling of torch-cut edges unnecessary except for precision finishes. Unit has portable cutter which holds torch and feeds it along straight line at desired speed. Known as C & H Straight line cutter, it will hold any torch.



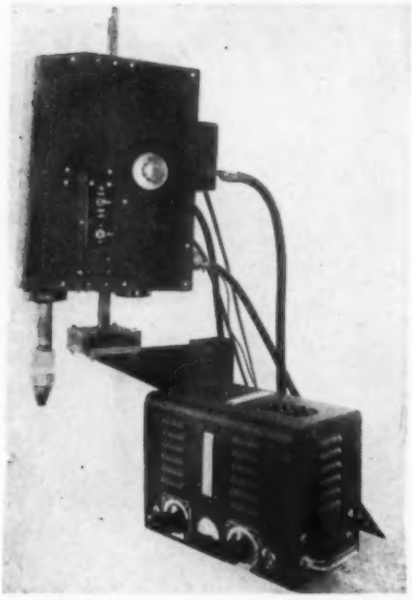
CIRCLE-CUTTING ATTACHMENT—*Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.* Attachment for Oxweld CM-16 portable shape-cutting machine makes it possible to oxy-acetylene circle-cut to the edges and in corners of plates. The CM-16 can cut circles of 2½- to 9-in. radius when equipped with the device.

CIRCLE CUTTER—*Cutting Machine Div., Ohmstede Machine Works, Beaumont, Tex.* Circle cutter consists of a semi-circular support, a main column, and an overhead aluminum arm which houses the hydraulic speed-control unit and the power unit. Spindle projects from arm and carries torch in circular path up to 40 in. dia. It can cut and bevel at the same time. Power comes from a sealed coil spring wound by rotating the arm 1 1/3 rev. counterclockwise.

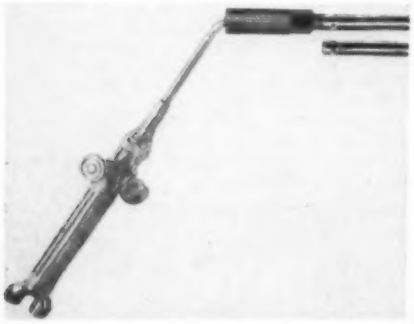


CIRCLE-BURNING — *Scientific Research Co., 1618 N. Vancouver Ave., Dept. F-18, Portland 12, Ore.* The Flash circle burner is a torch attachment for cutting accurate circles, curves or straight lines in plate. Circles from 2½- to 17-in. dia. may be cut. An extension bar with adaptor makes it possible to make cuts up to 10-ft. dia.

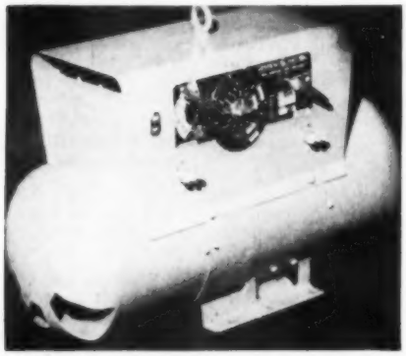
ARC TORCH—*C. E. Phillips & Co., Inc., 2750 Poplar St., Detroit 8, Mich.* Welding and brazing operations for which a soft flame is required can be done by the double-carbon-arc process with an arc torch. Torch is said to make all arc-welding machines available for most welding, brazing or heating jobs. The torch will accommodate ¼- to ⅜-in. dia. carbon electrodes without changing holders or using adapters.



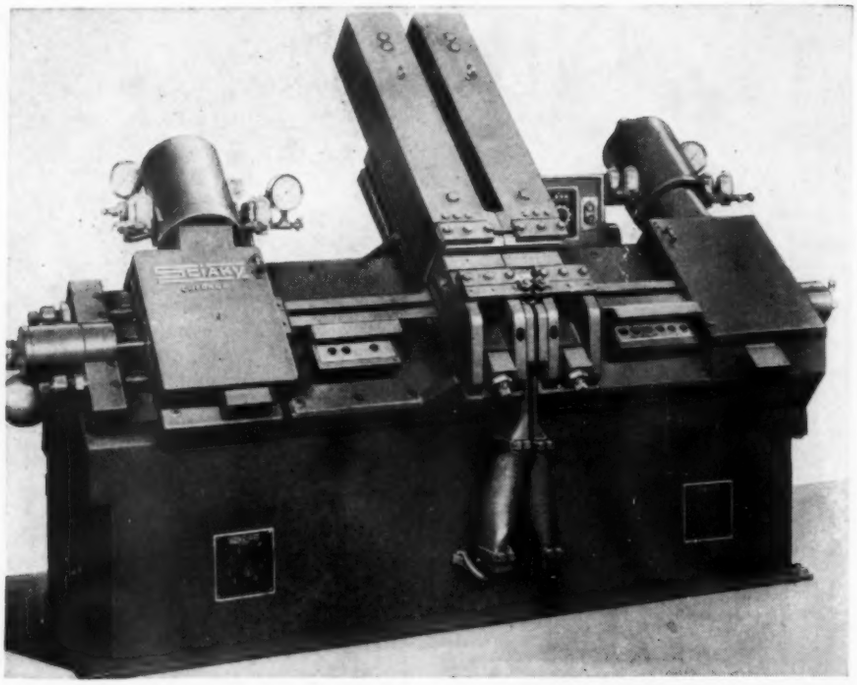
WELDING UNITS — *Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.* Two Heliwelding units, a machine-type electrode holder and an automatic unit, are for high-speed welding of light metals such as stainless steel, aluminum and magnesium. Machine holder can be mounted on a Radiograph or other travel mechanism. Airco automatic Heliweld unit (illustrated) is designed for continuous operation. It automatically maintains constant arc length.



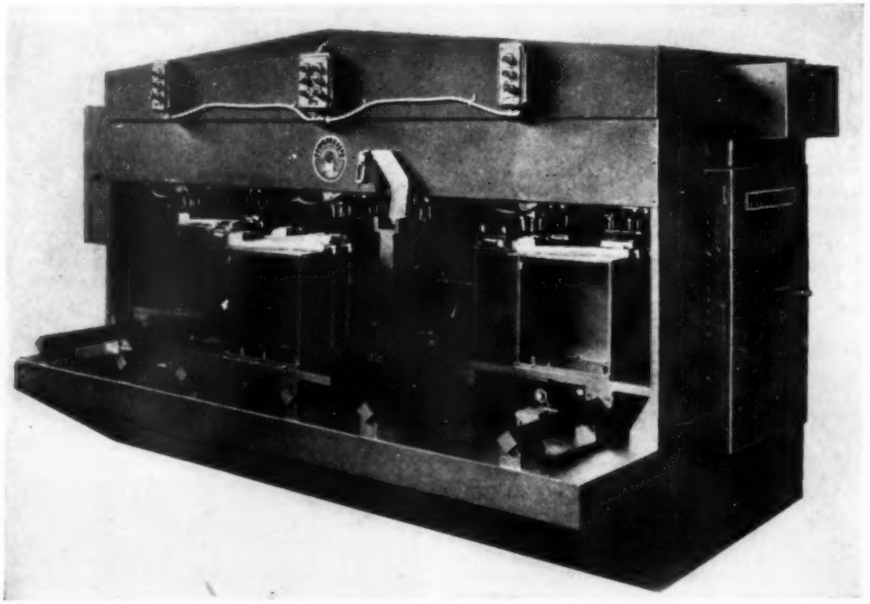
WELDING TORCH—*Cesco Products, Inc., 30 N. LaSalle St., Chicago 2, Ill.* The Cesco Puddler fits over the end of standard welding torches and is used with acetylene alone. Applications are body soldering, tinning, silver soldering and heating jobs.

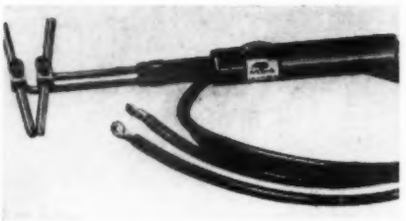


ARC WELDERS—*General Electric Co., Schenectady 5, N. Y.* A line of heavy-duty single-operator dc. arc-welding machines, Type WD-40, operate at 3500 rpm. and is available in 200-, 300- and 400-amp. NEMA ratings.



FLASH WELDERS — *Sciaky Bros., 4915 W. 67th St., Chicago 38, Ill.* A line of flash welders are 75-kva. for 0.90 sq. in. mild steel and up to 500 kva. for capacities up to 5 sq.in. A lever controls flashing and upsetting on the smaller welders; the large welders can be power operated or use a combination of lever flashing and power upsetting.



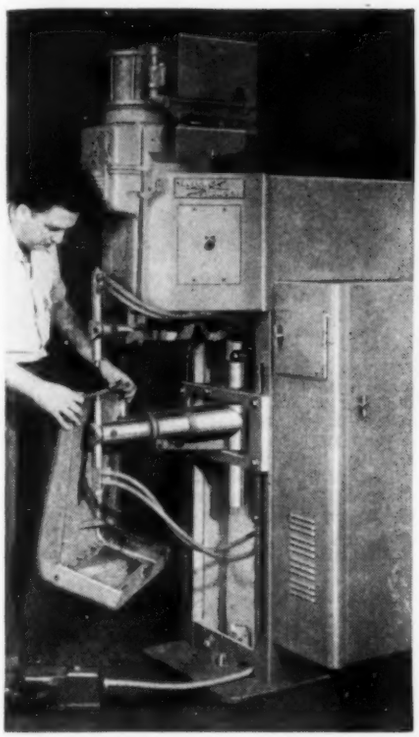


ARC-WELDING TORCH—*K. O. Lee Co., Aberdeen, S. D.* "Knock-Out" ac. arc-welding torch incorporates feather-touch slide control designed to provide fast make-and-break of the arc flame. Weight is 1¼ lb., ⅜- and ¼-in. carbons are used interchangeably without adapters.

MULTI-SPOT WELDER—*Progressive Welder Co., 3050 E. Outer Dr., Detroit, Mich.* Multiple-transformer automatic spot welder produces 300 steel drawers per hr., 100 each of three different sizes. Machine has three separate units, each with six 14-kva. transformers, each transformer taking care of two welds. All guns can weld simultaneously. Drawers are automatically clamped, rolled into position, welded and returned to unloading position.

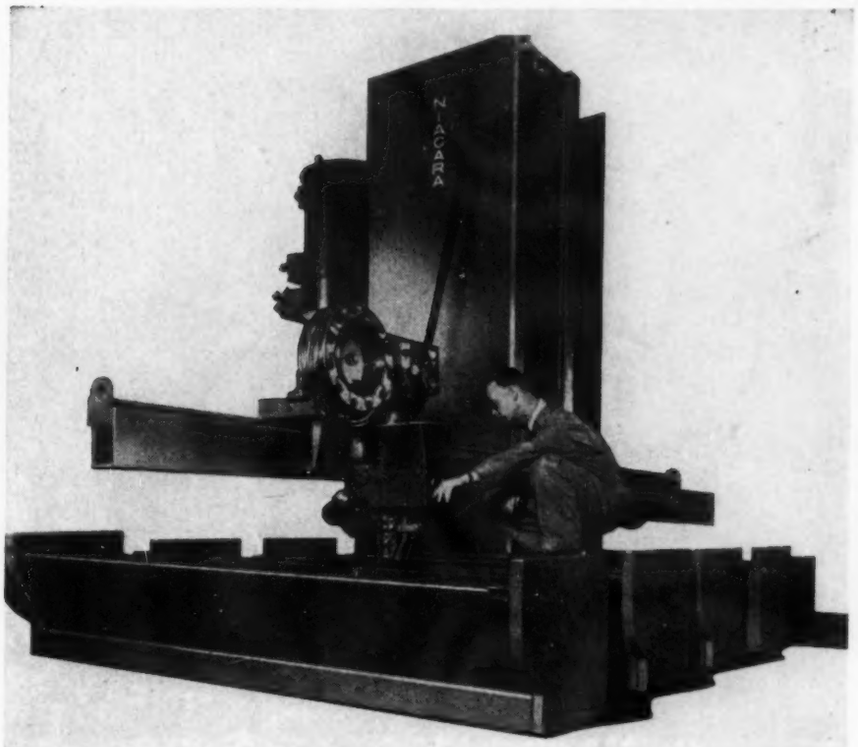
WELDER CONTROL—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Electronic resistance welder control and several types of special control panels typical of machine-tool requirements are announced.

"OXYARC" PROCESS—*Arcos Corp., 1515 Locust St., 402 Gulf Bldg., Philadelphia 2, Pa.* A method for hand cutting or piercing stainless and stainless-clad alloy steel and other metals. A holder with a tubular coated "Oxycuttend" rod, which is consumed in the process of cutting, is used with either a dc. or ac. welder. Oxygen is supplied through the tube.



PRESS WELDERS—*The Taylor-Winfield Corp., Warren, Ohio.* Type ENB air-operated press, in two styles, has a roller anti-friction welding head designed to permit high off-center welding forces, minimize deflection and insure ram alignment. Style 1, in four types, is either a projection welder or a combination projection and spot welder when horns are used. Style 4, also in four types, is a spot welder with a swiveling lower horn. Maximum welding force on the largest welder of each style is 1275 lb.

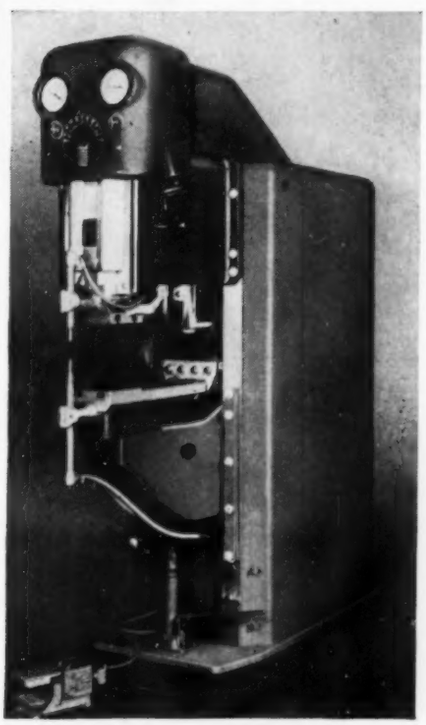
FLASH WELDERS — *Progressive Welder Co., 3050 E. Outer Dr., Detroit 12, Mich.* A line of four improved standard-motor flash welders is designed for flash-welding almost any metal including aluminum. Capacities are from 20 to 150 kva.—or battery-operated for any jobs within the physical capacity. Maximum stock width, vertical fixture, is 2, 4, 6, 8 in.



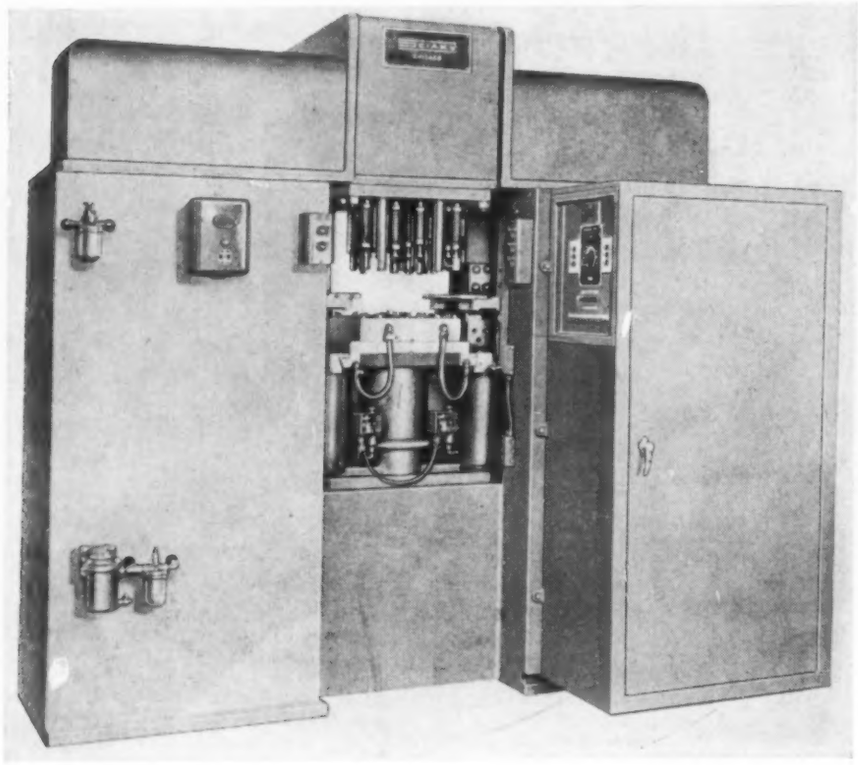
ELECTRONIC WELDER — *Niagara Machine and Tool Works, 683 Northland Ave., Buffalo, N. Y.* Automatic unit has electronic control which provides variable speed of machine along track. Length of weld governed only by track length. Welds perpendicular to track accomplished by traveling welding head along cantilever beam. Unit has centralized pushbutton station for all adjustments and movements.

WELDING TRANSFORMER — *General Electric Co., Schenectady, N. Y.* Type WP ac. welding transformer is used with the inert-arc welding process. Used for welding aluminum, magnesium and beryllium copper in an argon-gas atmosphere without use of flux, it can be used for a wide range of other metals. It is suitable for manual and machine operation.

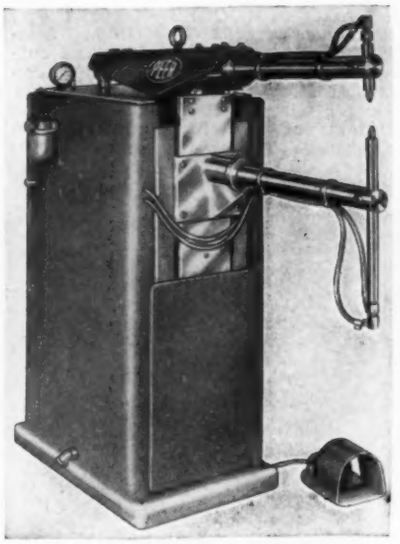
ARC TORCH—*Cesco Products, Inc., 30 N. LaSalle St., Chicago 2, Ill.* Litening torch is used with ac. and dc. welders. Aluminum and other metals can be welded, and brazing, soldering, preheating and hard surfacing are possible. Two models use ¼- and ⅜-in. carbon.



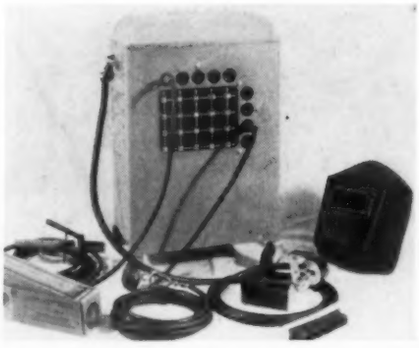
WELDERS—*Progressive Welder Co., 3050 E. Outer Dr., Detroit 12, Mich.* A line of improved roller-head, press-type spot and projection welders has capacities ranging from 50 to 500 kva.



MULTIPLE WELDER—*Sciaky Bros., Inc., 4915 W. 67th St., Chicago, Ill.* Type MGMS2-8 performs hot-upsetting, spot-welding and projection welding of intricate parts to steel panel in one operation. One panel can be completed in less than 20 sec. Any welding sequence can be set on telephone-jack type control panel.

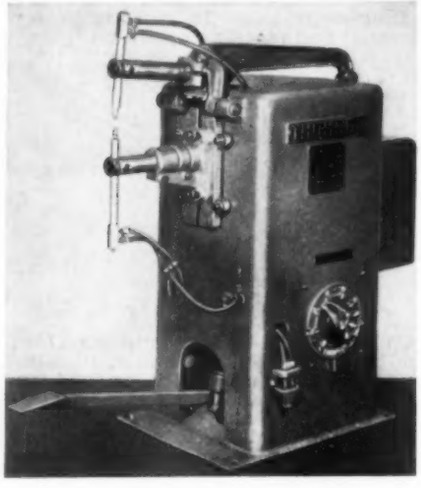


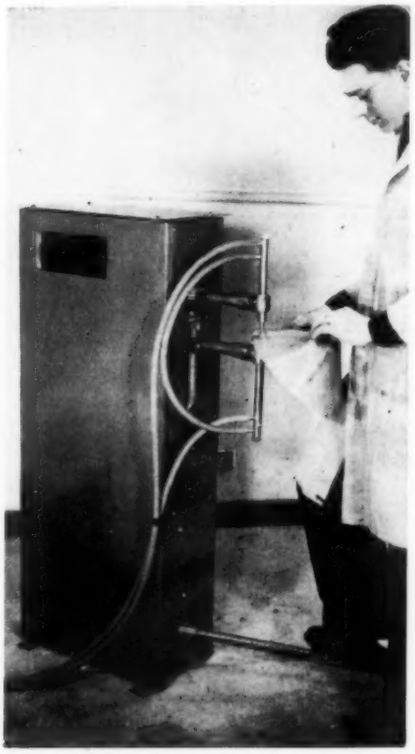
SPOT WELDER—*Pier Equipment Mfg. Co., Benton Harbor, Mich.* A-200 series of high-speed automatic, air-operated, rocker-arm spot welders incorporates a double-acting air cylinder to provide high electrode pressure. Welder capacities are 10 and 15 kva. with throat depths of 8, 12, 18, 24 and 30 in.



WELDER — *Westinghouse Electric Corp., 306 4th Ave., Box 1017, Pittsburgh 30, Pa.* The Flexarc limited-input-type general-purpose transformer arc welder comes in output rating of 130, 160 and 180 amp. The three models, WT-13, WT-16 and WT-18, have 20 steps of current adjustment from 30 amp. to rated maximum.

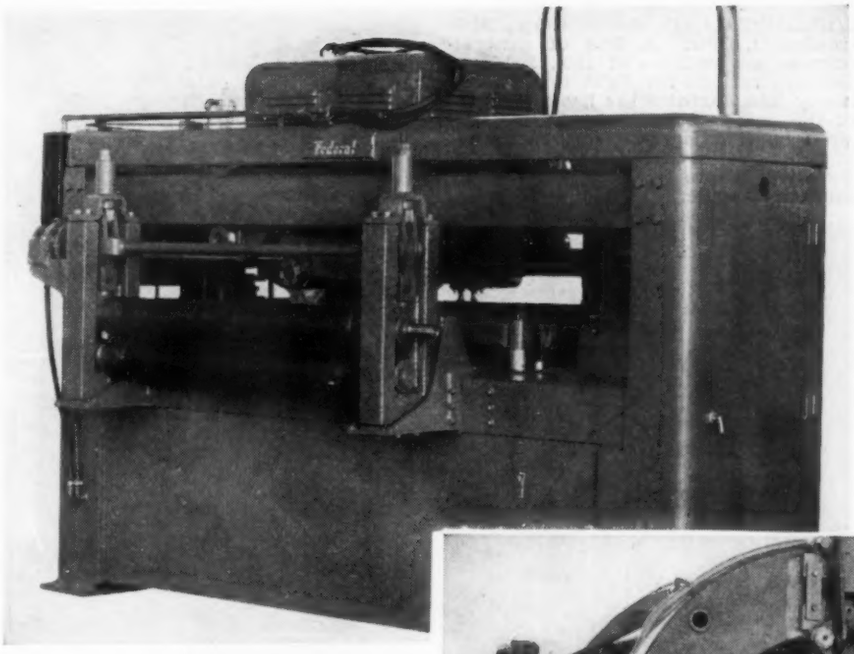
SPOTWELDERS—*Weldex, Inc., Dept. K, 7324 McDonald Ave., Detroit 10, Mich.* Electronically timed spotwelder series consists of two high-speed, automatic and air-operated models. Model 752-P is a press-action type; model 752-R is a rocker-arm type. Both are rated at 7½ kva. and are for production welding on thin metals up to two thicknesses of 14-gage cold-rolled steel.



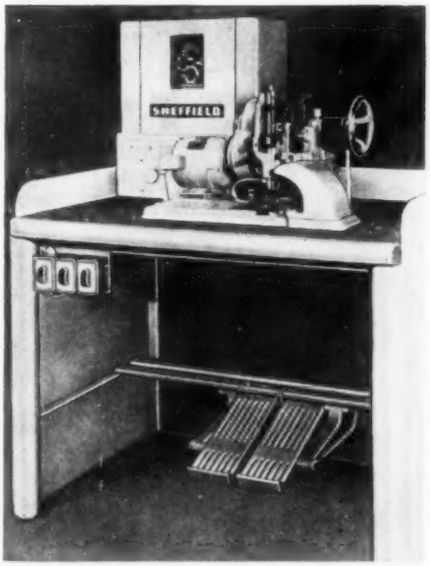


SPOTWELDER—*The DoAll Co., Des Plaines, Ill.* A 10-kva. Taylor Hall spotwelder, designed for production welding, has an automatic electronic timing device and magnetic contactor built in.

SPOT WELDERS—*Thomson Electric Welder Co., Lynn, Mass.* The R-series rocker-arm spot welder for work in the light to medium range is available as a foot-, air- or motor-operated machine with 12, 24 or 30-in. throat depth and 20, 30 or 40 kva. transformer capacity. Speeds up to 120 spots per ← min. can be obtained.



WELDER — *Federal Machine and Welder Co., Warren, Ohio.* Double-roll traveling-head series seam welder joins strip ends or skelps for long machine runs. Available in four sizes for welding 38-, 48-, 56- or 66-in. line either right- or left-handed. Change-speed gear gives selective speed range of 10 to 27 or 20 to 54 fpm.



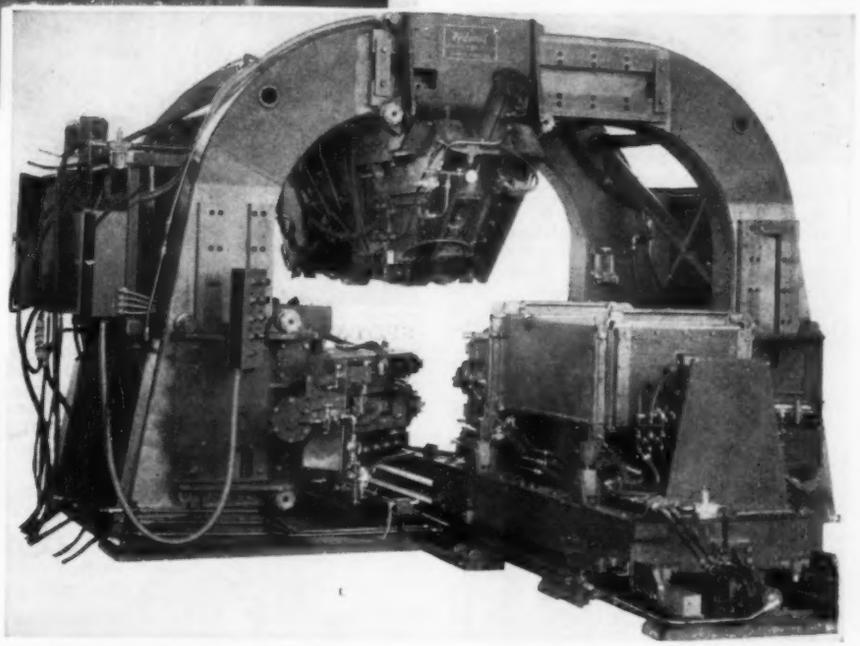
WELDING MACHINES — *Sheffield Corp., Dayton 1, Ohio.* Automatic welding machines handle contact-type points or disks. Electrical-contact material is said to be securely placed on contact springs at high production speeds. Capacity is 83 cycles per min. Production varies from 1200 to 2400 contacts per hr.

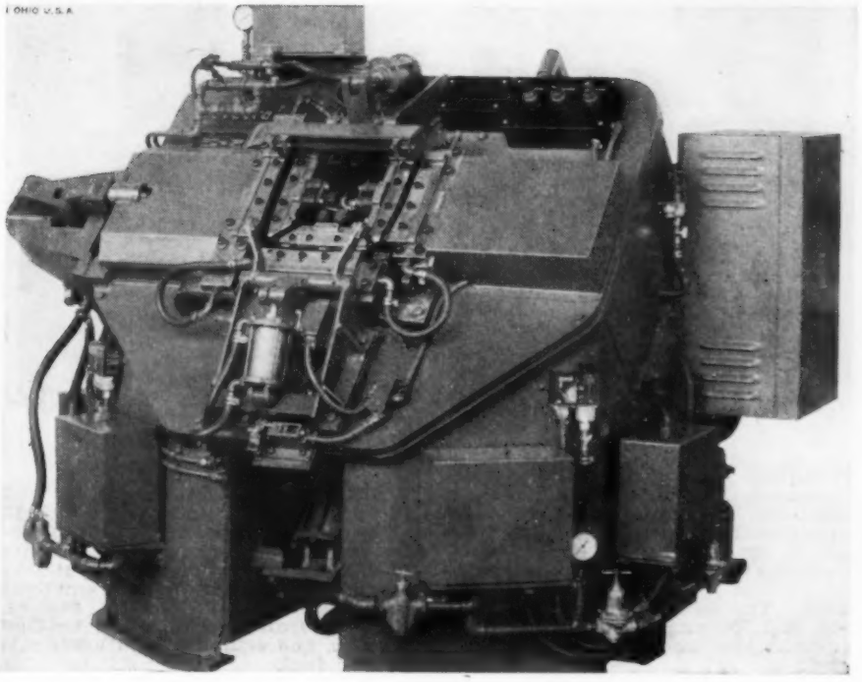
PROJECTION WELDER—*The Federal Machine & Welder Co., Warren, Ohio.* High production unit welds retaining strips and other sub-assemblies to steel stampings forming the main body assembly of typewriters. With one semi-skilled operator, unit produces approximately 200 assemblies per hr. →

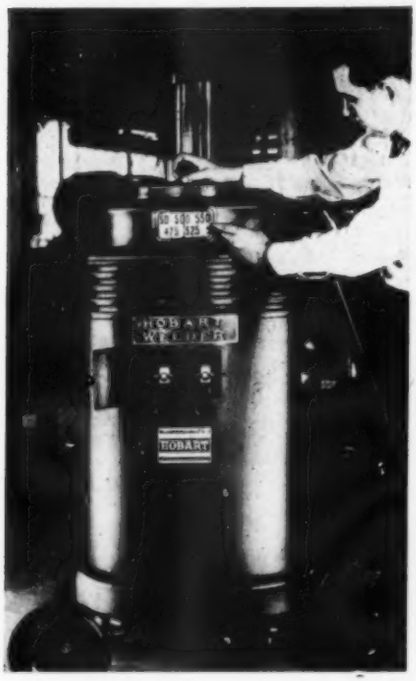
WELDER — *Federal Machine and Welder Co., Warren, Ohio.* Triple-head projection welder, for mounting brackets to cooling fins on compressor assemblies, produces 150 assemblies per hr., with a machine-cycle time of approximately 5 sec.

SPOT-WELDER—*Federal Machine & Welder Co., Warren, Ohio.* Automatic multi-point machine welds automobile front-fender stampings to fender rails, completes over 40 assemblies per hr. Fixture stroke is from 6 to 8 in.

WELDER — *Federal Machine and Welder Co., Warren, Ohio.* A high-production mash seam welder known as the Triple Duplex Traveling Head Series seam welder, has three 300-kva. water-cooled welding transformers wired for 440-v, 60-cycle ac. power supply. The welding heads are manually adjustable. ↓

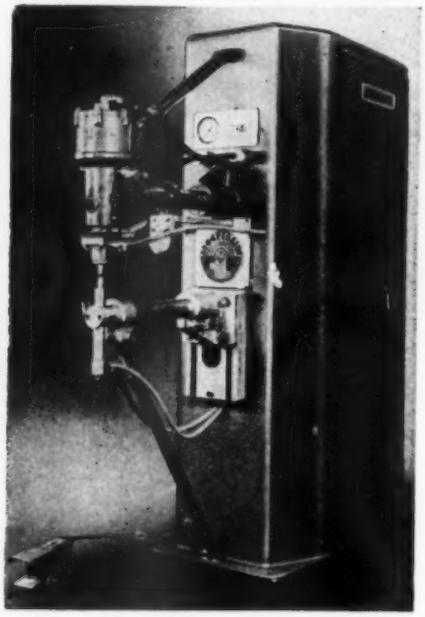




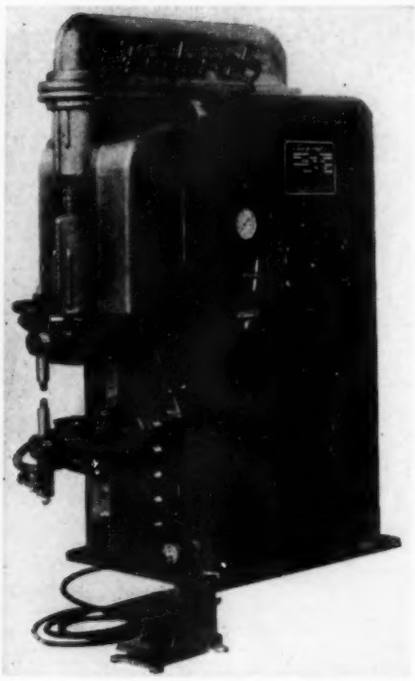


TRANSFORMER WELDERS — *The Hobart Brothers Co., Troy, N. Y.* Industrial ac. transformer welders have large illuminated current-indicating scale that can be read in dark locations. Welders are moving-coil type with no adjustable magnetic paths. The welders are furnished in 300- and 500-amp. sizes.

WELDERS—*A. O. Smith Corp., Milwaukee 1, Wis.* A line of general-purpose ac. welders of 150-, 200- and 250-amp ratings for light to medium-heavy jobs contains the basic features of the heavy-duty Smithway line. Desired current is obtained by the use of a handwheel at the top of the unit. Presettings are read on the 14-in. amperage scale.

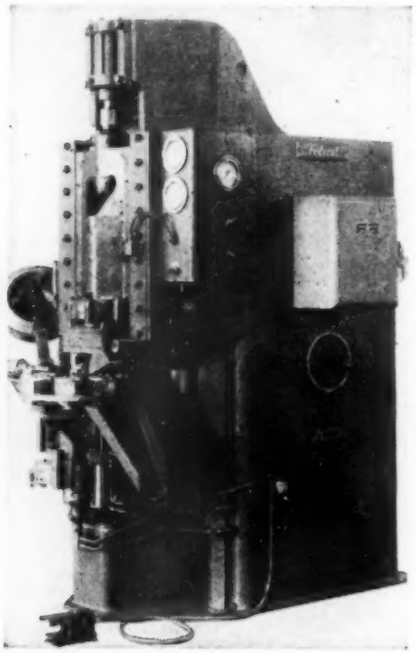


SPOT-WELDERS—*Progressive Welder Co., 3050 E. Outer Dr., Detroit 12, Mich.* Improved line of 30-, 50- and 75-kva. pedestal-type spot-welding machines has heavy structure concentrated at front of machines, permitting ligh sheet-metal construction for rear.

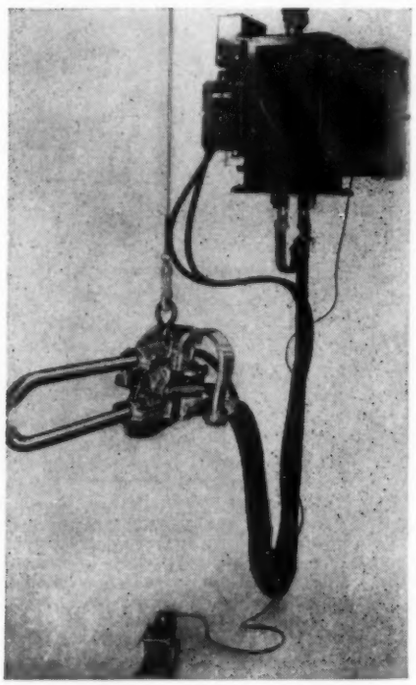


WELDER—*The Federal Machine and Welder Co., 1 Dana St., Warren, Ohio.* A bench-type combination spot and projection welder, a general-purpose, air-operated unit, will weld mild steel, stainless steel, aluminum and other metals. A special low-inertia rubber head with micro-switch firing is incorporated. Stroke of the unit is 2½ in.

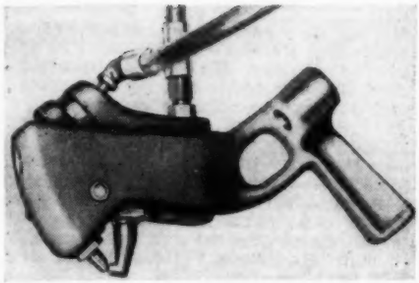
WELDER — *Lincoln Electric Co., Cleveland 1, Ohio.* An ac. welder, Fleet-Arc, is equipped with a booster to augment the current the instant the arc is struck. Arc is started automatically without using high-frequency devices when electrode touches work. The welder is produced in 200, 300, and 500 amp. A selector switch controls the amount of booster current.



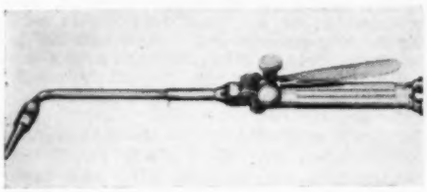
WELDER — *Federal Machine and Welder Co., Warren, Ohio.* PH4-12 high-production welder welds gasoline-engine push-rod assemblies at rate of 1200 per hr. It has an eight-station automatic-dial-feed table equipped with indexing and locking devices. Unit is furnished with eight welding fixtures, and equipped with automatic hopper feed.



GUN WELDER—*Eisler Engineering Co., Inc., 743 S. 13 St., Dept. 3, Newark 3, N. J.* A portable air-operated gun welder is for spot welding light-gage sheet metal. It will weld heavier work when short holders are supplied. Horns can be exchanged to fit 8- to 24-in. throat depths. Rating is 30 to 75 kva.



WELDING GUN AND BOOSTER—*Dalhart Engineering & Mfg. Co., 14287 E. Jefferson, Detroit 15, Mich.* A hydraulically operated double-acting welding gun and booster is designed to provide uniform hydraulic pressure at point of weld and is said to eliminate destructive burning or pitting by reducing the arc to a minimum. Speed of the gun is limited only by the speed by which a solenoid air valve can be operated. Life of welding points (at 3000 spots per hr.) is 108,800 spots.



WELDING TORCH—*Weldit, Inc., 990 Oakman Blvd., Detroit 6, Mich.* A handle-length lever on the W-46 torch makes it possible to shut off or release gas with finger-tip pressure.

FLUX—*All-State Welding Alloys Co., 96 W. Post Rd., White Plains, N. Y.* No. 39 flux for joining aluminum with dissimilar ferrous and non-ferrous metals at low working temperatures is used with aluminum solder. Joint is said to be considerably stronger than that made without the flux. It is available in paste form.

METALLIC COATING — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Eutectofilm, a metallic coating applied to bare welding rods insures the obtaining of high physical properties in the deposit, assists in surface alloying at low base-metal heats, and protects filler metal from corrosive attack. It is standard on most EutecRods for torch applications.

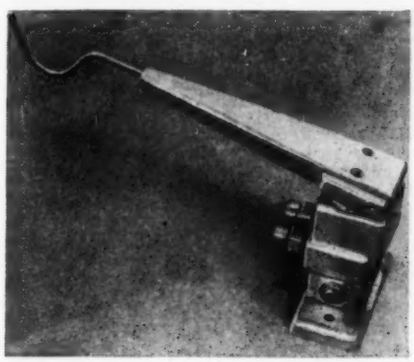
TIP-CLEANING—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Wypo tip cleaners for cleaning oxy-acetylene-welding and cutting tips are in two sets. No. 1 has 12 cleaners for drill sizes from No. 75 to No. 49. No. 2 has nine cleaners for drill sizes from No. 48 to No. 30.

DIFFUSION PASTE—*Sherman & Co., 197 Canal St., New York 13, N. Y.* A paste for brazing carbide tips to steel shanks known as Nu-Braze silver-alloy Diffusion Paste No. 50, consists of a finely pulverized silver-brazing alloy ground with a proportion of special flux. The flux begins to melt at 480° F.

ARC-WELDING COMPOUND—*G. W. Smith & Sons, Inc., 5400 Kemp Rd., Dayton 3, Ohio.* POM is an electrically conductive, inorganic composition to supplement the fluxing action of welding-rod coating. It is a paste thinned with an equal part of water and brushed or sprayed into the seam and adjacent surfaces where spatter collects.

FLUX—*All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N. Y.* All-State No. 31A flux, an aluminum flux for brazing sheet aluminum melts at 950 F., becomes quite active at 1000 F. It gives capillary action to the brazing alloy and helps carry it along the seams or joints to be welded.

FLUX—*Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.* Flux is compounded to dissolve chromium oxides encountered in welding of stainless steels and high-chromium bearing alloys. Immediate and surrounding surfaces to be welded are painted to protect the molten metal from air. Airco Formula No. 34 is in ¼- and 1-lb. cans.

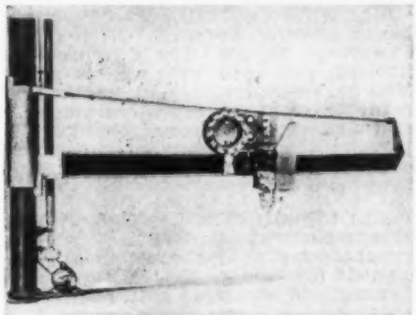


VALVE—*The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.* Shutoff valve cuts down argon consumption in production Heliarc welding. Known as Oxweld V-30, valve controls both argon and water supply at pressures to 100 psi.

ELECTRODE TIP DRESSER—*C. O. Porter Machinery Co., 666 Front Ave., N.W., Grand Rapids, Mich.* An electrode tip dresser permits dressing of electrodes in a few seconds without removing them from the welder. The unit is adaptable to portable guns, short-stroke stationary welders and multiple-point welders.

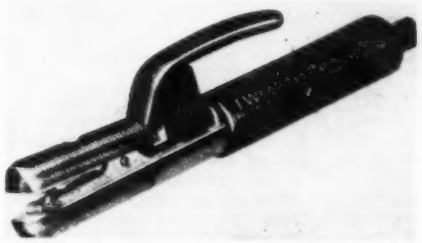
CUTTER—*Conical Tool Co., 443 Division, South, Grand Rapids 3, Mich.* Cutter used for dressing or pointing up burned and deformed welding tips in electric spotwelders without removing tip from machine. Designed to form tips in a few seconds.

WATER SAVER—*Weltronic Co., Dept. K, 19420 W. Eight Mile Rd., Detroit 13, Mich.* The Weltronic Water Saver eliminates turning on or shutting off cooling water in a welding operation. It can be used with any type welding machine. It is designed so that if welding machine stops for a period of time longer than 30, 60 or 90 sec. water stops flowing.

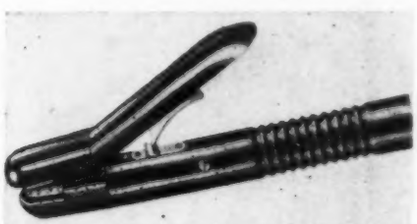


ARC POSITIONER—*Mark F. Gouran, Welding Engineer, 7426 Devon St., Mt. Airy, Philadelphia 19, Pa.* The Arc Positioner is comprised of an automatic shielded-arc welding head traveling on a beam encompassing a vertical zone of 8 ft. assembly rotates around fixed axis with a radius of 10, 15 or 20 ft. Traveling assembly consists of "Lincolnweld" head, carriage.

TIPS—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Three multiflame brazing tips, Styles 721, 722 and 723, are designed for use in silver brazing, high-temperature brazing and application of hard-facing alloys. They will operate with gas combinations such as oxyacetylene or natural gas. They also have applications where aluminum and copper are used.



ELECTRODE HOLDER—*The Lacey-Webber Co., Kalamazoo, Mich.* The Little David, a tong-type electrode holder is rated at 350 amp. for rods up to ¼-in. dia. Said to operate with only a 50-F. temperature rise, it is made of aluminum alloy, weighs 12 oz. and has a slip-on insulating cover used on either the top or bottom jaw.



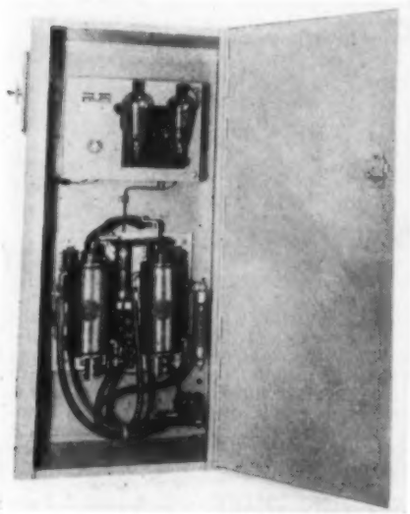
ELECTRODE HOLDER — *Tweco Products Co., Wichita 1, Kan.* Model A-316 Twecotong electrode holder has 250-amp. capacity and holds 1/16- to 3/16-in. electrodes. Weight is 18 oz., and length is 9 in. Tip and body insulation is molded laminated glass-cloth Bakelite using "Tubular-Keyed" Tweco design.

WELDING TIMER—*Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.* Electronic welding timer, type 30CR3, is designed for the interval timing of welding operations of 3 to 120 cycles. It is applicable to manual, air- or motor-operated welding equipment, and provides beat or non-beat timing (initiation of timing cycle by momentary contact or sustained contact).

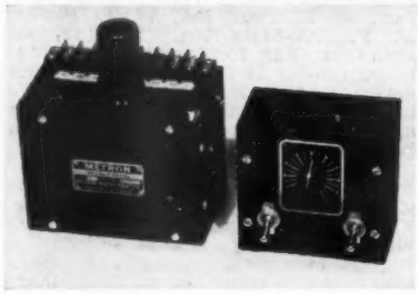
WELDING CONTROLS — *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* The Synchro-Trol line of packaged synchronous-precision ac. resistance-welding controls is made in eight factory-wired subunits and five supplementary subunits. It permits a wide variety of times and sequences. Controls may be side- or floor-mounted.

WELDER CONTROLS—*The Taylor-Winfield Corp., Warren, Ohio.* Non-synchronous welder controls are designed for foot-, air-, motor- and hydraulically-operated spot, projection, butt and seam resistance welders.

ELECTRONIC CONTACTORS — *Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.* Line of electronic contactors, class 8990, using ignitron tubes, is designed for resistance welding jobs involving high-speed operation or heavy primary currents of short duration. Contactors are made to supplement Syncro-Break and High-Speed magnetic contactors used when a wide range of weld times and duty cycles is required.



CONTROLS—*Control Div., General Electric Co., Schenectady, N. Y.* A line of non-synchronous electronic resistance-welding controls includes combinations of ignitron contactors and sequence-weld timers, with or without electronic heat control. Each set of controls is mounted in a single cabinet.



ELECTRONIC TIMER—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Small welding and industrial electronic timers provide intervals from 1/60 sec. to several minutes in one or several continuously variable ranges.

WELDING CONTROLS—*Control Div., General Electric Co., Schenectady, N. Y.* Redesigned line of synchronous precision controls for resistance welding machines houses all components in one cabinet. Components include ignitron contactors, weld timer and electronic heat control.

WELDING CONTROLS — *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* A line of non-synchronous packaged ac. resistance-welding controls known as Weld-O-Timer, are made in two frame sizes, the 1200 and 600.

TIMER—*Ripley Co., Inc., Middletown, Conn.* No. 52D Timatron, and automatic electronic welding timer gives control to flow of current in timing weld. Control has capacity to time any machine up to 10 kva. and is adjustable from 0.1 to 5 sec. by hand control. Size is 4¾ x 5⅛ x 9 in. high.

ELECTRODE—*Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.* The DH-MO electrode for welding low-alloy cast steel or low-alloy high-tensile-strength rolled steels in the flat position is used with ac. or dc. straight polarity. It is in four sizes from 5/32- to ¼-in. dia.

ELECTRODE—*Electric Welding Div., General Electric Co., Schenectady, N. Y.* Type W-94 electrode for hard-surfacing applications where resistance to impact, wear and abrasion is required is available in 14-in. lengths with diameters of ¼, 3/16, 5/32 and ⅛ in.

ELECTRODE—*Hobart Brothers Co., Troy, Ohio.* Hobart No. 12 electrode increases welding speed or poor fit-up work. Heavily coated, electrode is designed for dc. straight polarity or ac., at higher current ratings. It is available in five diameters from 3/32 to ¼ inch.

EUTECTRODES — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* EutecTrodes 67 AC and 670 DC for arc-welding at low base metal heat have a high alloy content and were developed for work on all types of steel. Diameters available are 3/16, 5/32, ⅛ and 3/32 in.

ELECTRODE — *Ampco Metal, Inc., Milwaukee 4, Wis.* Shielded-arc silicon-bronze electrode operates on reverse-polarity dc. Called Sil-Trode, it was developed for use as an electrode of similar composition to the parent metal when fabricating and repairing silicon-bronze parts. It is available in five diameters from 3/32 to ¼ in.

ELECTRODE — *Wilson Welder and Metals Co., Inc., Dept. 1543P, 60 E. 42nd St., New York 17, N. Y.* Improved Wilson No. 512 all-position, mild-steel electrode can be used on ac. and dc. reverse-polarity current.

ELECTRODES—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Low-temperature EutecTrodes 66 AC and 660 DC for arc welding steel at low base-metal heat are flux-coated for all types of steel and are available in four diameters: 3/16, 5/32, ⅛ and 3/32 in.

ELECTRODE COATING — *Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.* An improved shielded-arc coating has been developed for the five grades of Ampco-Trode ac. electrodes for welding cast iron, malleable iron, aluminum and silicon bronzes, and other metals. Ac. transformers with 75 to 85 v. open circuit are used.

ELECTRODE—*Welding Div., Harnischfeger Corp., Milwaukee 14, Wis.* A P&H cast-iron electrode, Nicast, for either ac. or dc., produces welds said to be non-porous and fully-machinable in both weld and fusion-zone areas. An all-position electrode, Nicast is available in ⅛- or 5/32-14-in. sizes.

WIRES AND TAPES—*Air Reduction, 60 E. 42nd St., New York 17, N. Y.* Automatic arc-welding wire and tape line includes five knurled-type wires and five tapes, all for flat position operation. They are made in several diameters.

WIRES, TAPES—*Wilson Welder and Metals Co., Inc., 60 E. 42nd St., New York 17, N. Y.* Five Una knurled-type automatic wires and five Una flux-impregnated tapes are for flat-position operation. Electrode applications include thin-gage, sheetmetal forms, axle housings and boilers.

ELECTRODES—*Alloy Rods Co., York, Pa.* A line of mild-steel electrodes and low-alloy, high-tensile steel electrodes is known as the Weld-Arc line. Electrodes are made in ten types: six for mild steel and four for low-alloy, high-tensile steel.

ELECTRODES — *Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.* AP-MO electrodes are for dc. reverse-polarity welding of low-alloy cast steel or low-alloy high-tensile-strength rolled steels in all positions. Available in three diameters from ⅛- to 3/16-in., they are designed for butt and fillet welds.

ELECTRODE—*Speer Carbon Co., St. Marys, Pa.* ACWeld carbon electrodes, used with ac. welding equipment set at the proper amperage, are said to give wide flame useful in brazing copper and brass tubing, in bending, forming and heat treating, soldering and welding.

ELECTRODE—*Hobart Brothers Co., Troy, Ohio.* No. 13 electrode is recommended for out-of-position welding on light-gage sheet metal and for welding light sections of mild steel to heavier ones. Made in diameters of 1/16, 5/64, 3/32 and ⅛ in.

ELECTRODE — *Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* An electrode for machinable welds on cast iron is the Airco No. 375. It does not need ordinary preheating. It is usable in downhand, vertical or overhead positions, on ac. or dc., and comes in 5/32- and ⅛-in. dia.

ELECTRODES — *Electric Welding Div., General Electric Co., Schenectady, N. Y.* A line of tungsten electrodes for atomic-hydrogen and inert-arc welding is in diameters of from 0.040 to ½ in. and lengths from 3 to 24 in. They can be used for manual or automatic welding.

ELECTRODES—*Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.* SW-2 electrodes are for ac. or either polarity dc. (straight preferred) welding of mild steel in all positions. Available in four diameters from 3/16-in. to 5/16-in., the electrodes are said to produce welds with desirable flat contours, side-wall wash-up, freedom from undercutting, and easy slag removal.

ELECTRODE—*Air Reduction Sales Co., 60 E. 42nd St., New York, N. Y.* Airco No. 312 improved electrode is an all-position mild-steel electrode designed to produce low-hydrogen-content welds. It now can be used on both ac. and dc. reverse-polarity and no longer requires preheating to obtain porosity-free welds.

ELECTRODE—*The McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.* Hardalloy is a dc. reverse-polarity arc-welding electrode providing deposits which are highly resistant to impact or abrasive wear in hard-surfacing operations. There are five sizes from 3/32 to ¼ in.

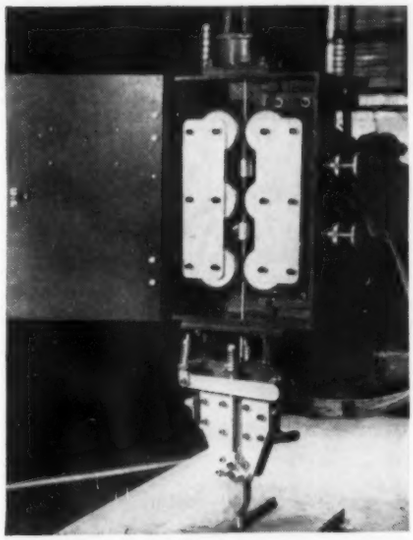
ELECTRODES—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* A line of Airco stainless-steel electrodes in full range of diameters and grades is furnished with a heavy-extruded lime-type coating for dc. application. A lime-titania coating is available for all electrodes, except straight-chrome analyses, for ac. or dc. Lime-titania electrodes are said to eliminate arc-blow and result in easier manipulation and uniform arc action.

ELECTRODE—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Airco 190 electrode has been improved so that necessity for preheating has been minimized when welding high strength chrome-moly aircraft steels. Ductile welds up to approximately 150,000-psi. tensile strength are said to be produced. Available in diameters of 3/32, ⅛, 5/32 and 3/16 in.

ELECTRODE—*A. O. Smith Corp., 3533 N. 27th St., Milwaukee 1, Wis.* The SW-16 for light-gage welding of mild steel in the sheet metal field, is high-speed, heavy-coated electrode for all-position welding. It is said to produce a bead contour that requires little finish grinding.

ELECTRODES—*Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.* Ni-Cast shielded-arc electrodes are made to bond with all grades of cast iron with a minimum of penetration and heating. Electrodes can be used with ac. or either polarity dc. They are manufactured in 3/21- ⅛-, 5/31- and 3/16-in. dia. The nickel core wire has a coating free of fluorides.

WELDING ROD — *The American Brass Co., Waterbury 88, Conn.* Anaconda Nickel Silver 828 welding rod, for oxy-acetylene white-bronze welding of steel and cast iron, melts at approximately 1690 F. Used only with oxyacetylene welding or brazing technique, it is not suitable for arc-welding methods. Available in sizes ⅛ in. and larger.



COATED ELECTRODE — *Hollup Corp., Div., National Cylinder Gas Co., Chicago, Ill.* An automatic welding electrode, Shield-O-Matic, is said to combine advantages of manual shielded-arc welding and continuous automatic welding. It is said to stand extreme flexing without losing flux, and can be fed into the arc from a reel. Flux is held to the wire by grid construction. Current is conducted through the flux to the core.

WELDING ROD — *All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N. Y.* A low-temperature welding rod for zinc-base die castings has a 3/32 in. dia., round form, and working temperature of 400 F. Known as No. 53 zinc-base die-cast rod, it has 25,000-psi. shear strength, and can be used with or without flux.

WELDING ROD—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Airco No. 23A silicon-copper welding rod is for copper welding. Made in ¼-, 3/16- and ⅛-in. dia., it is said to be the equal of silver-copper rods for this class of work.

ANODE RODS—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Adjustable anode rod for use in alkaline solutions and chrome baths is used for plating of irregularly shaped parts in still plating tanks.

WELDING RODS—*All-State Welding Alloys Co., Inc., 96 West Post Road, White Plains, N. Y.* Two nickel-silver welding rods. One is for production and fabrication of light steel and nickel alloy sections, and is suitable for low-temperature welding. The other rod is used where resistance to frictional wear is desired and for work on worn or broken parts.

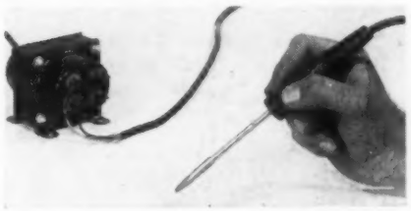
WELDING ROD—*American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill.* A high-speed steel welding rod, Amsco Toolface, is especially adapted for production of composite cutting tools where hard-surfacing and resistance to shock are required. Deposits vary with the dilution of the metal from 575 to 675 Brinell hardness.

BRAZING ROD—*All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N. Y.* The No. 31 sheet-aluminum brazing rod can be used on the thinnest commercial sheet aluminum and is said to produce corrosion-resistant welds with a tensile strength of 30,000 psi.

SOLDERS—*Fusion Engineering, 1836 Euclid Ave., Cleveland 15, Ohio.* Series of Super Solders in paste form contain the flux, cleaner, tinning agent and actual metallic solder. Series covers three temperature ranges: 200 to 500 F., 500 to 750 F., and 1150 to 2000 F.

SOLDER ROD—*All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N. Y.* No. 7 cast-iron solder rod is said to produce corrosion-resistant welds and is used for jobs such as repairing cracks in cast iron. Melting temperature is 600 F. All-State No. 7 flux is used, except when brazing dissimilar metals to aluminum, when No. 53 flux is used.

ALUMINUM SOLDER—*Alsoco Corp., 10 E. 52nd St., New York, N. Y.* Alsoco, an aluminum solder is said to have high corrosion, electrical and vibration resistance and will solder aluminum to aluminum or copper without flux.

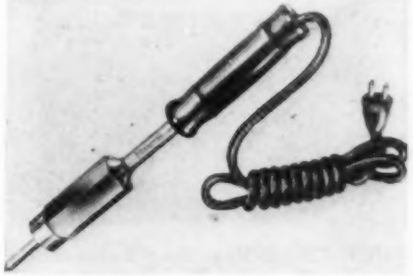


SOLDERING IRON—*Industrial Heating Div., General Electric Co., Schenectady, N. Y.* The "Midget" lightweight Calrod soldering iron is designed for precision soldering where space is limited and is available with ¼- and ⅛-in. dia. tips. The unit is 8 in. long and weighs 1¾ oz. without cord.

SOLDERING-FLUX STICK — *Lake Chemical Co., 607 N. Western Ave., Chicago 12, Ill.* Flux-Stik can be applied to hot or cold metal, but, because of non-running properties, it will cover only the immediate vicinity of the soldering joint and not spread all over the metal. It is non-acid.

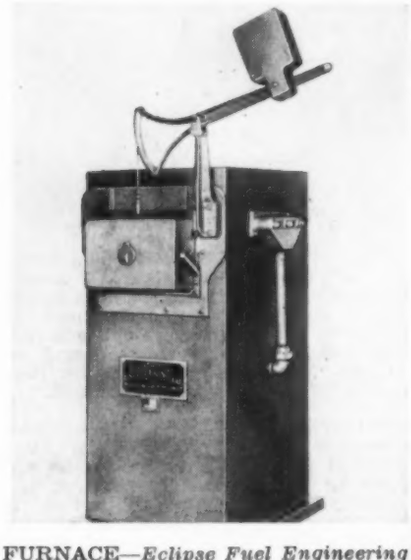
SOLDERING TOOL—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* The Thermo-Grip soldering tool has been redesigned to heat 20% faster. It has a thumb switch for close heat control. It includes power unit with a soldering tool operating like pliers, and is rated at 1000 w.

ALUMINUM SOLDER — *All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N. Y.* No. 39 low-temperature rub-on solder for aluminum work is applied without flux. Used in filling and soldering where tightness is essential and strength unimportant.

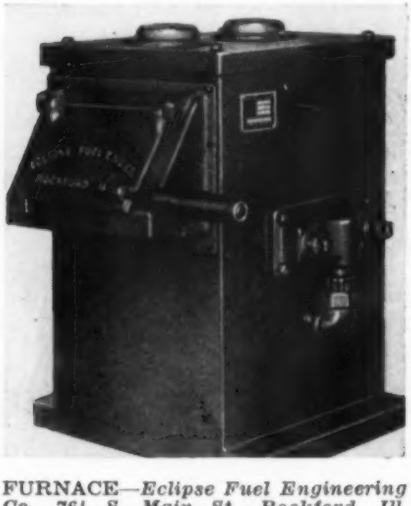


SOLDERING IRON—*Hexacon Electric Co., 135 W. Clay Ave., Roselle Park, N. J.* A 300-watt soldering iron with a ⅜ in. (instead of ⅞ in.) dia. tip, provides high heat and is fitted for fast production-line soldering.

BRAZING MACHINE—*Selas Corp. of America, Philadelphia 34, Pa.* An automatic brazing machine designed for a brass sink fixture, gives automatic control of heat-pattern and heat-time, fuel supply and assembly pressure. It completes the brazing operation in 30 sec., and three stations are provided in a loading, heating and cooling sequence. One station is illustrated.



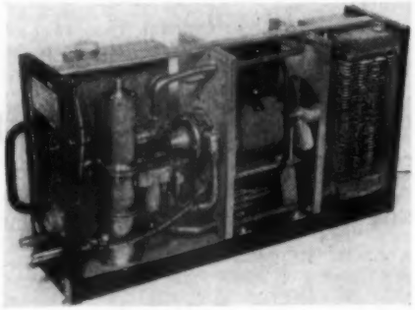
FURNACE—*Eclipse Fuel Engineering Co., 764 S. Main St., Rockford, Ill.* Gas-fired Oven Furnace No. 814-16, in two temperature ranges, 1400 to 1800 and 2000 to 2500 F., can be used for heat-treating carbon tool steel, alloy steel and high-speed steel.



FURNACE—*Eclipse Fuel Engineering Co., 764 S. Main St., Rockford, Ill.* The improved Model 1-B bench-type oven furnace has combustion equipment designed for use with low-pressure air (10 to 16 oz.) Temperature range is 1400 to 1600 F. and is suitable for intermittent use.

FURNACES — *Surface Combustion Corp., Toledo 1, Ohio.* Two prepared-atmosphere furnaces have been added to the line of standard-rated heat-treating furnaces, known as Balco atmosphere furnace and Balco gas-carburizing furnace. They both utilize "RX" gas as the protective atmosphere.

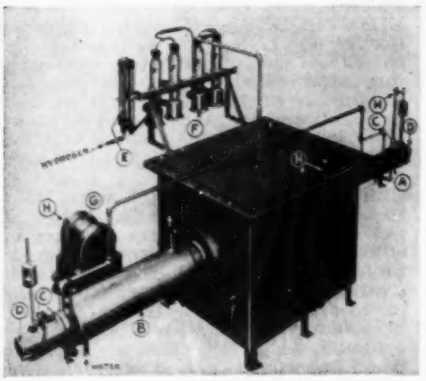
GAS-FIRED UNIT—*Selas Corp. of America, Philadelphia 34, Pa.* An automatic gas-fired machine for heat-treating fragile lightweight assemblies handles magnetic pull wires for business machines at the rate of 1200 pieces per hr.



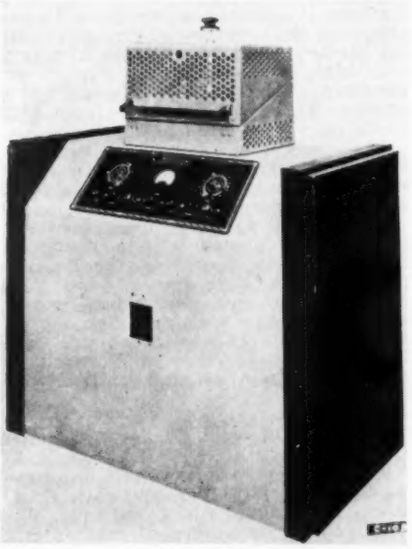
HEAT-TRANSFER—*New Haven Div., Eastern Industries, Inc., New Haven 6, Conn.* The Model No. 1 heat-transfer unit will dissipate up to 1000 w. depending upon temperature range. It is equipped with a four-bank radiator, cooling fan, circulating pump, reservoir, flow switch, thermostat and necessary fittings. The motor is 1/40-hp. Size of the unit is 19⅝ x 5¼ x 10½ in.

CONTINUOUS FURNACE — *Bellevue Industrial Furnace Co., Detroit, Mich.* Furnace for relieving stresses in V-type automobile cylinder-block castings has 40 pressure-type gas burners, is 70 ft. long. Walls are 9-in. thick, have 4½ in. of 2300 F. insulating refractory and 4½ in. of brick. Overhead conveyor provides capacity for loading one casting each 45 sec.

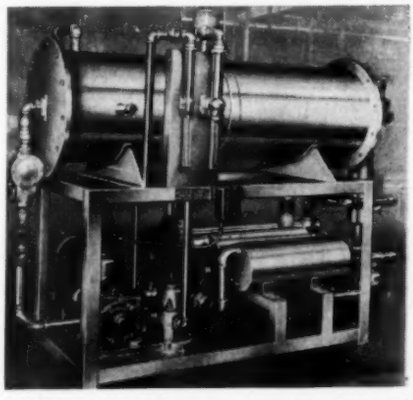
HEATER—*Agnew Electric Co., Milford, Mich.* Four-station resistance electric heater accommodates knee-action control arms prior to forging operation. Cycle is automatic except for loading and unloading. Rate is said to be 1000 pieces per hr. with one operator.



ELECTRIC FURNACE—*Eisler Engineering Co., Inc., 740-770 S. 13th St., Newark 3, N. J.* Unit degasifies and anneals rare metals in hydrogen atmosphere, can take temperatures to 3000 F. A—loading chamber, B—Water-cooled unloading chamber, C—weighted safety doors, D—glass peepholes, E—hydrogen-flow gage, F—drying towers, G—auto transformer, H—test pipe with cock.



HEATING GENERATOR — *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* A 2-kw. dielectric heating generator, the 40.9-Mc Dual Timer, is used to heat plastic preforms. It has a special cubicle providing two sets of operating controls.



GAS PRODUCER—*Bellevue Industrial Furnace Co., 2971 Bellevue, Detroit 7, Mich.* Unit generates prepared atmosphere by partially burning (exothermic reaction) natural, artificial or propane gas.

FURNACE — *Cooley Electric Mfg. Corp., Indianapolis, Ind.* Two furnaces are the recirculating air-draw type. One, Model ACL, can operate at temperatures to 900 F., and the other, Model ACH, can operate to 1200 F. Both handle 50 lb. of parts.

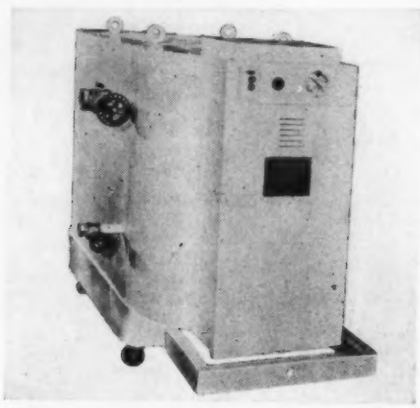
FURNACE—*Cooley Electric Mfg. Co., Indianapolis, Ind.* Model VK-5 electric furnace is said to provide accurate temperature control from 300 to 2000 F. and can operate continuously. It is suitable for heat-treating of small parts. Furnace has 4650-w. power capacity.

BURNER—*Aeroil Products Co., 5701 Park Ave., West New York, N. J.* The Aeroil-Schramm power-driven burner has applications such as: straightening, bending, shrinking and expanding work; skin-drying foundry molds; and general repair work. Flame length is 6 in. to 15 ft. in vertical or horizontal position. Temperature range to 2000 F.

METAL-MELTING—*Johnson Gas Appliance Co., Cedar Rapids, Iowa.* Furnace, Model 1019, handles lead, tin, zinc, pot metal, type metal, aluminum and other metals. Equipped with nine burners, it has capacity of 1000 lb. of lead and delivers pot temperatures to 1400 F.

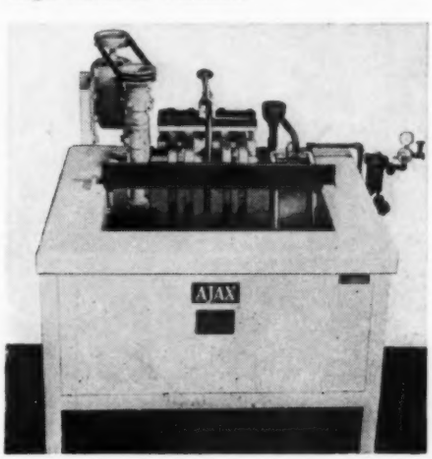
GAS FURNACE—*Johnson Gas Appliance Co., 589 E Ave., N.W., Cedar Rapids, Iowa.* Model 616 melting furnace, which will melt 600 lb. of lead in 29 min., is equipped with six atmospheric-fired Direct Jet bunsen burners, each with independent shut-off valve and pilot light.

SALT-BATH PROCESS—*Upton Electric Furnace Div., 7450 Melville at Green, Detroit, Mich.* A process to prevent wasting away of electrodes in high-temperature salt-bath furnaces uses graphite rods to take oxides out of the salt and at the same time build up the electrodes.

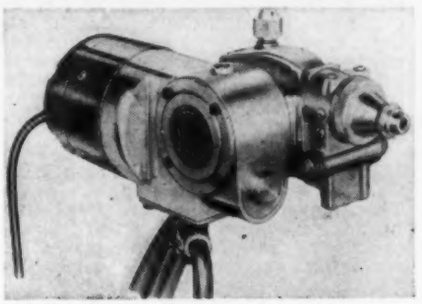


HEATING UNIT—*Castaloy Corp., 197 S. Waterman, Detroit 17, Mich.* The Vacu-Therm generator delivers a mobile heating unit for plastics controlled heat to 550 F. (plus or minus 5°) under low operating pressures. It is made in 16-, 22- or 33-kw. capacity sizes.

VACUUM FURNACE — *Eitel-McCullough, Inc., 1570 San Mateo Ave., San Bruno, Calif.* Materials highly reactive toward gasses are heat-treated in a high-vacuum furnace.

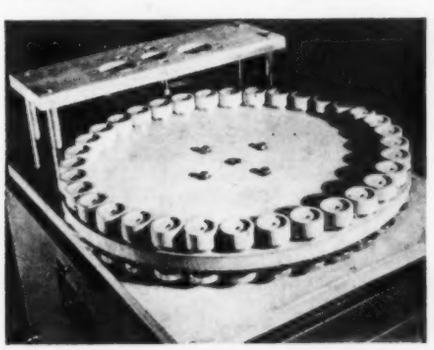


FURNACE—*Ajax Electric Co., Frankford at Delaware Ave., Philadelphia, Pa.* Isothermal quench furnace, for use with Ajax isothermal heat-treating process acts as a heat exchanger to hold quenching bath at constant temperature.



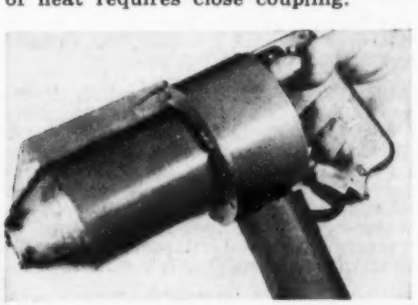
SPRAY GUN—*Metallizing Co. of America, 1330 W. Congress St., Chicago 7, Ill.* Powered by an electric motor, the Mogulectric metal spray gun uses different combinations of gearing, obtaining almost any spraying speed. Only adjustments are gas and air.

PREHEATING OVENS — *Despatch Oven Co., 619 8th St., S.E. Minneapolis, Minn.* The "Hydro-Therm" line of ovens for preheating plastics by moist convection-heat process are electrically heated drawer-type units, having automatic heat controls and accommodating up to 50 lb. of preforms per charge. They are available with 4, 6, 9 and 12 drawers.



TURNTABLE—*Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23, N. Y.* An improved automatic turntable is designed for continuous soldering, brazing and annealing of small ferrous and non-ferrous parts. Parts to be treated are placed in small cup-like receptacles, simplifying loading and unloading. As many as 68 parts per min. can be processed.

INDEXING TABLE — *Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23, N. Y.* Automatic indexing table for soldering, brazing and annealing round or irregular small parts where shape or control of heat requires close coupling.

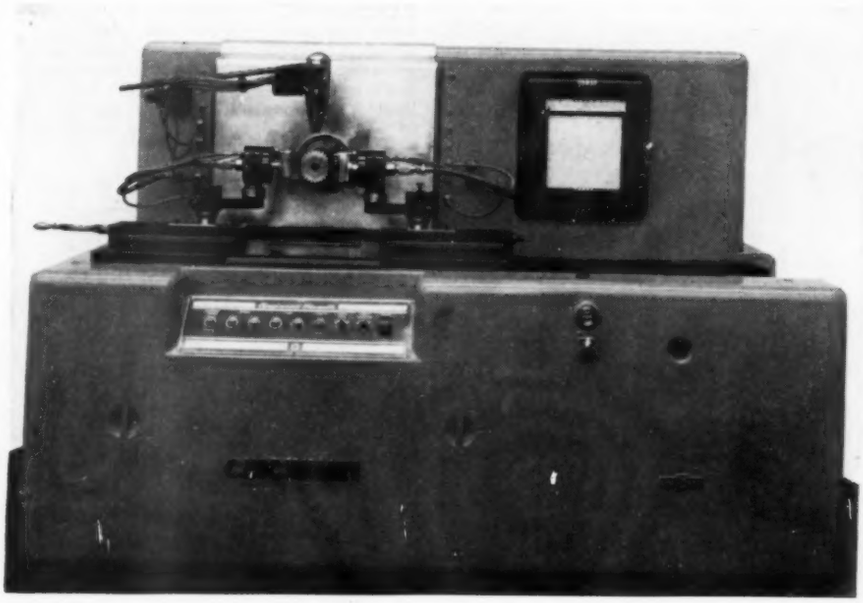


HEAT GUN—*Tocco Div., Ohio Crankshaft Co., Cleveland, Ohio.* Heat gun is a portable inductor adaptable to cumbersome assemblies where many spot-heats are required or to short production runs. Used with standard 10,000 cycle motor-generator type induction heater.

WELDING and HEAT-TREATING — Furnaces and Heaters

MARQUENCHING—*The A. F. Holden Co., New Haven 8, Conn.* Marquenching furnace is for austempering and martempering. Parts are quenched into furnace, cooled to bath temperature, and then cooled to finished transformation of martensite. Normal operating range is 350-750 F.

HEAT-TREATING TABLE — *Selas Corp. of America, Philadelphia 34, Pa.* The heat-treat table for annealing, hardening and other heat-treating operations at production speeds has revolving variable-speed jig table. Two Superheat burners are supplied.



INDUCTION HEATER—*Electric Arc, Inc., 12 Jelliff Ave., Newark 8, N. J.* The Model UP induction heater, an adaption of the Smith-Dolan system, is for preheating and normalizing for welding. It is made in 10 kva. units which may be stacked to form groups of 2 and 3 units with capacities of 20 and 30 kva. The 30-kva group illustrated can preheat a 10-in. pipe to 1300 F. in 2 hr.

INDUCTION HEATER — *The Ohio Crankshaft Co., 3800 Harvard Ave., Cleveland, Ohio.* A 750-w., 450,000-cycle Toccotron bench-type induction-heating machine is designed for silver brazing and soldering. It can be adapted to annealing, hardening and forging applications. Unit is designed for both manual and automatic operation.

INDUCTION HEATER—*Tocco Div., Ohio Crankshaft Co., Cleveland, Ohio.* A 7½-kw. output Toccotron unit is an electronic-type induction heater which operates at about 3 megacycles to heat very small or thin parts.

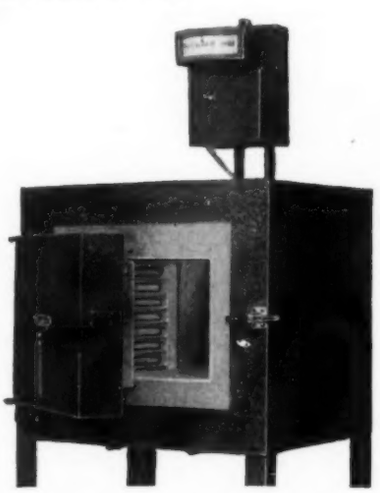
ACCESSORY UNIT—*Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* Accessory unit for induction heating is portable and can be held in position at any coil by rubber suction cups. Work is located on a spindle which is actuated by a water-driven turbine. Interchangeable quench rings and adapters are available with I.D. of 4¾, 7, 9 and 12 in.

ELECTRONIC GENERATOR—*RCA Engineering Products Dept., Camden, N. J.* Brazing and soldering small and medium sized work is the purpose of this 1-kw. electronic power generator. It is a vacuum-tube unit which converts the 60-cycle power supply to a frequency of approximately 400,000 cycles per sec. It contains an automatic timing device.

TOCCO MACHINE—*Tocco Div., Ohio Crankshaft Co., Cleveland, Ohio.* A 30,000-cycle Tocco machine said to triple the previous high-frequency limit of motor-generator type induction-heating equipment. Can surface-harden parts under ⅜-in. dia.

CONVERTER—*Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.* Self-tuning high-frequency converter has a 20-kw. rating for induction heating. It can be used for steel melting up to 30 lb., and for melting gold, silver and other precious metals.

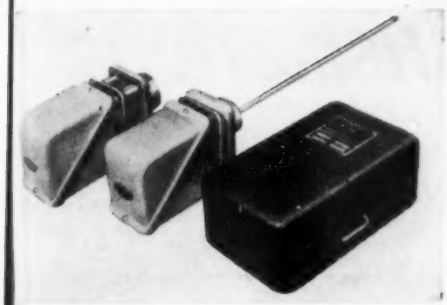
SURFACE HARDENING—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* The Flamatic hardening machine for production quantities incorporates an electronic control system which permits rapid heating of parts to preset temperature, followed by oil quench. Operation is automatic except for loading. Unit handles parts that lend themselves to rotation. Capacity: shafts to 18 in. long, parts with diameters to 8 in.



HEAT-TREATING—*Gilbert S. Simonski, 407 N. Broad St., Philadelphia 8, Pa.* Furnace, Lucifer Model DL 7052 electric, has automatic electronic control. Range is to 2000 F., and rating is 6.5 kw. Unit has 12x12x10-in. muffle space.

TRANSFORMER—*Tocco Div., Ohio Crankshaft Co., Cleveland, Ohio.* A variable-ratio transformer is designed to increase adaptability of motor-generator type induction-heating equipment. Can be made to match any size load or inductor coil.

GENERATOR — *Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* The Ther-Monic Model 43 induction-heating generator is a 750-w. bench-type unit. Full-load output is 43 Btu. per min. The Model 43 combines power section and work applicator in one unit.

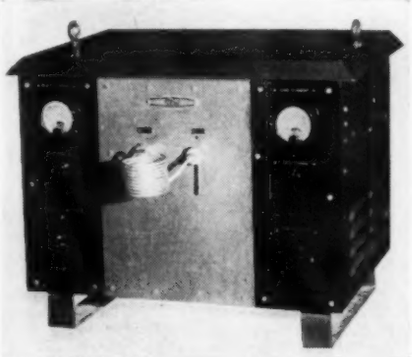


FLAME SAFEGUARD—*Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.* The Fireye Photoelectric Flame Failure Safeguard, a protection against explosion in industrial oil burners, automatically turns off the fuel supply when the flame fails.

PISTON RECONDITIONER—*Wilkening Mfg. Co., Philadelphia 42, Pa.* Thermo-sizer reshapes and resizes alloy pistons to fit the cylinders in which they operate. Pistons are also cleaned of carbon, gum and sludge. Machine utilizes heat-shaping.

QUENCHING RINGS — *Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23, N. Y.* Larger quenching rings are used for semi-automatic hardening of gears and similar parts. Sizes range from 4- to 18-in. I.D. and are interchangeable.

HEAT CONTROL—*Control Div., General Electric Co., Schenectady, N. Y.* A phase-shift heat-control accessory for resistance-welding machines is used with ignitron contactors or non-synchronous control combinations that do not have the heat-control feature.

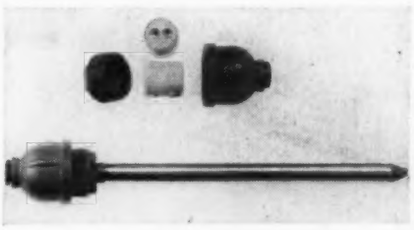


HEATER—*Scientific Electric Div., "S" Corrugated Quenched Gap Co., 107 Monroe St., Garfield, N. J.* 2-kw. bench-model high-frequency induction heater is for surface hardening, brazing, soldering, annealing and other heat-treating operations. Work coil is ½- to 2½-in. dia., with one to 20 turns.

RECORDING—*The Bristol Co., Waterbury 91, Conn.* Series 500 line of recording thermometers and gages with simplified construction and other improvements, incorporate the same basic principles of former models. Available in 8- and 12-in. sizes in wide variety of ranges.

TEMPERATURE REGULATOR — *Leslie Co., 129 Delafield Ave., Lyndhurst, N. J.* Class MG-2 self-contained, direct-operated temperature regulators, for gas control to process heating, operate over ranges from 20 to 600 F., at inlet pressures up to 25 psi. They are supplied with screwed ends ⅜-, ½- and ¾-in. sizes.

INDICATOR—*Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.* The Speedomax Indicator for logging a large number of thermocouple temperatures in a short time. The unit can be supplied with switching arrangements to handle more than 100 thermocouples.

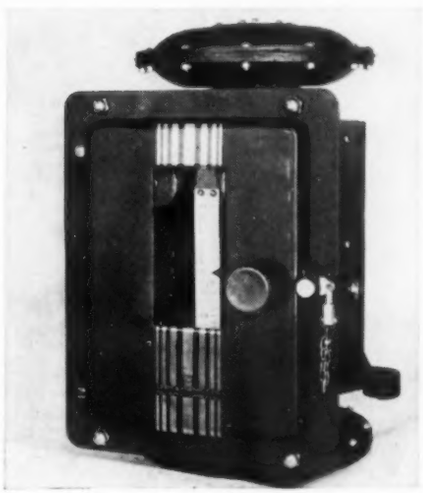


THERMOCOUPLE—*Arklay S. Richards Co., Inc., Newton Highlands 61, Mass.* A thermocouple that can be used with any make of pyrometer can be inspected without disconnecting leads or using a screwdriver. The thermocouple element can be removed by loosening two screws. Available in standard lengths from 12 to 48 in.

INPUT CONTROLLERS — *Thermo Electric Mfg. Co., 461 W. Locust St., Dubuque, Iowa.* Stepless input controller and temperature indicator provides both variable control and indication of temperature. Size is 9 in. wide, 5 in. high and 8 in. deep, and weight is 6 lb. Eight models are available.

CONTROLLER — *Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago 10, Ill.* An electronic pyrometer controller for furnaces, melting pots or heating devices using electricity, gas or oil known as Alnor Controller, is used for both production and laboratory operations.

THERMOCOUPLE—*Industrial Heating Div., General Electric Co., Schenectady 5, N. Y.* Nickel-nickel moly thermocouple will stay on calibration in reducing atmospheres at temperatures as high as 2100 F. Thermocouple element, supported by ceramic insulators, is enclosed in protection tube welded at hot end to make it air tight.



CONTROLLER—*Leeds & Northrup Co., 4938 Stenton Ave., Philadelphia 44, Pa.* Air-fuel ratio controller employs electric-motored valve drives and needs no hydraulic piping. A balance-type unit, its ratio can be adjusted manually.

TEMPERATURE CONTROL — *Leeds & Northrop Co., 4934 Stenton Ave., Philadelphia 44, Pa.* The Electromax, a temperature control for applications where indicating and recording are not required is used for control of ovens, baths and other units. Standard ranges are 0 to 250 and 0 to 1000 F.

TEMPERATURE CONTROL — *Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.* The Xactline Capacitrol, a temperature-variant control instrument, combines features of Gordon Xactline control unit and the Wheelco electronic-principle Capacitrol. Applications include electric furnaces or ovens and electrically heated injection-molding machines. Control is said to be as close as ± 1/5 F.

TEMPERATURE CONTROL—*Taco West Corp., 2620 S. Park Ave., Chicago, Ill.* The Veritron, an electronic two-position controller is especially suited for installation on industrial furnaces and plastic-molding machines.

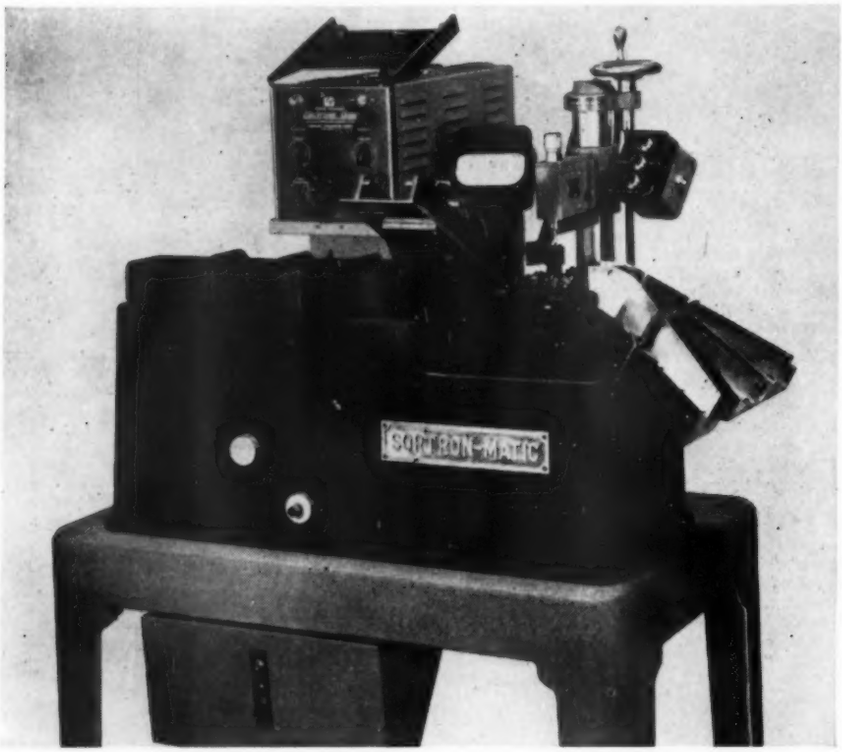
MONITORING SYSTEM—*Thomas A. Edison, Inc., West Orange, N. J.* Automatic system warns of overheated bearings. It is a multi-point temperature monitoring system capable of monitoring twenty-four bearings from each central control cabinet. Electrical-resistance bulbs with temperature-sensitive tips are used.

TEMPERATURE CONTROLLER — *The W. S. Macdonald Company, 33 University Rd., Cambridge, Mass.* A proportioning electronic temperature controller is said to maintain the temperature of electrically heated ovens within 0.1 F. at temperatures to 1200 F. accomplished by electronic adjustment of input power to oven.

CAPACILOG — *Wheelco Instrument Co., 847 W. Harrison St., Chicago, Ill.* Stripchart recorder, the Capacilog, is designed for the measurement indication control and permanent record of variables in the process industries. Unit adds the recording function with a positive power-driven pen.

Layout and Inspection

AMERICAN MACHINIST 35th ANNUAL REVIEW

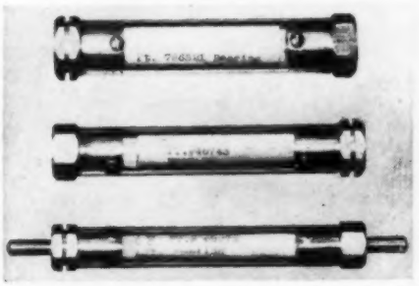


GAGE—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Sortron-Matic piston-pin gage, consist of five units modified to suit requirements. Feeding arrangement can be either automatic or manual. Classifying unit in some cases sorts automatically into 14 categories.

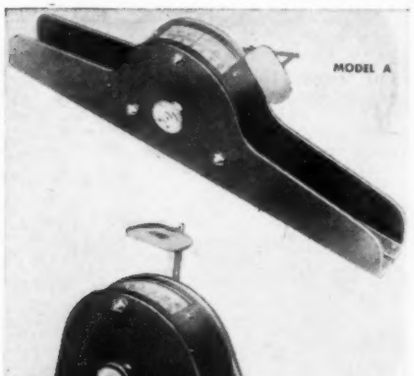
GAGING DEVICE—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* An electronic device which inspects 3600 plastic fountain-pen barrels per hr. called the "Sortron-Matic" gaging unit, inspects for accuracy of diameter and length, and sorts the barrels.

COMPARATOR GAGE—*Metron Instrument Co., 436 Lincoln St., Denver 9, Colo.* Electromagnetic comparator gage, with four ranges of magnification selected by switches, is for applications such as checking gage blocks and production inspecting.

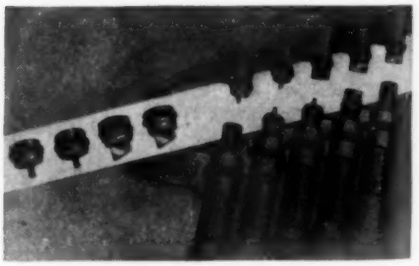
GAGES—*Rite-O Tool & Gage Co., 59 E. Eight Mile Rd., Hazel Park, Mich.* A line of Ritoloy gages are said to have a life 30 times that of hardened-steel gages. Ritoloy alloy is molecularly bonded to the steel base or shank and has a standard thickness of 0.008 in. on the side.



GAGE HANDLE—*Industrial Development Associates, Inc., 223 Spruce St., Bloomfield, N. J.* Vis-U-Trol transparent gage handle is made of a lucite tube into the ends of which are inserted steel gage ends. Data can be placed within the handle on cards. Available in SAE Nos. 1, 2 and 3.



ANGLE GAGE—*Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.* Clinometer vernier angle gage is in two models with all-aluminum housing and a window for easier reading. Action of instrument is by free-swinging drum graduated 360°. The gage is used on machine tools including lathes, drillpresses and shapers.



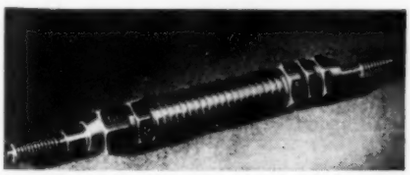
ADAPTERS—*McNaghten & Newell, 8654 Melrose Ave., Hollywood 46, Calif.* Set of four adapters for checking of recesses. Buttons fit any size micrometer and can reduce anvil, spindle, or both to approximately one-eighth size.

SQUARENESS-OF-FACE GAGE — *Bryant Chucking Grinder Co., Springfield, Vt.* A squareness-of-face gage to check the relationship between the pitch diameter of a thread and the face of the part on any Bryant thread gage mounts. Various models cover capacities from ⅜- to 8-in. internal-thread dia.

PLUG GAGES—*Size Control Co., Div. American Gage Machine Co., 2500 Washington Blvd., Chicago 12, Ill.* Reversible plain plug gages made of Norbide are said to have 200 times the life of former taper-lock steel gages.

MICROGAGE SET—*Van Keuren Co., 176 Waltham St., Watertown, Mass.* Set of microgages, No. M-21, for setting large micrometers, includes 1-, 2-, 3-, 4-, 5-, and 6-in. microgages which have ⅞-in. dia. The set will make combinations to 21 in.

MICROGAGES—*The Van Keuren Co., 176 Waltham St., Watertown, Mass.* The gages, which are precision gage blocks of round cross-section, have been increased in size from 11/16- to ⅞-in. dia. The microgages are available in sets of 5, 7, 16 and 35 blocks.



HANDLES—*Lincoln Park Industries, 1719 Ferris Ave., Lincoln Park 25, Mich.* Flexible handles for small diameter thread gages are all metal and provide flexibility said to reduce pressure on gage member. Supplied in place of solid handles on Lincoln Park Thread gages to No. 10 machine-screw size.

HEIGHT GAGE — *Aim Products Co., 1564 Main St., Springfield, Mass.* A quick-action vernier height gage measures in hundredths of inches from 0 to 6 in., in fractions by 64th's, or metrically by 10th's of millimeters to 15 cm.

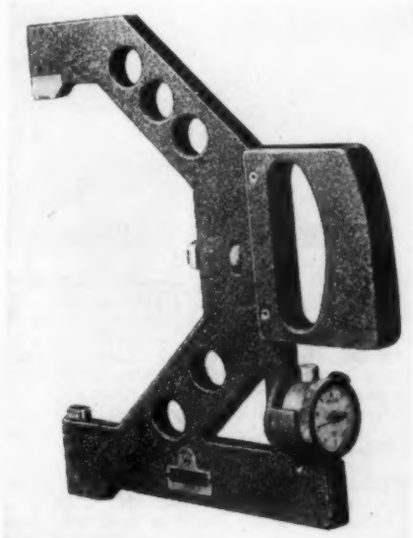
CRANKSHAFT MICROMETER — *Tubular Micrometer Co., St. James, Minn.* Direct-reading crankshaft micrometer measures journal diameters without removing crankshaft from engine block. Capacity is from 2 to 3 in. in English calibration or 50 to 75 mm. in metric.

HOLE GAGE — *Federal Products Corp., 1144 Eddy St., Providence, R. I.* The Model 1204 self-centralizing small-hole gage employs 14 interchangeable contacts to inspect a range from 0.250 to 0.500 in. It explores holes to max. depth of 2¼ in. and reveals inaccuracies in tenths of thousandths.

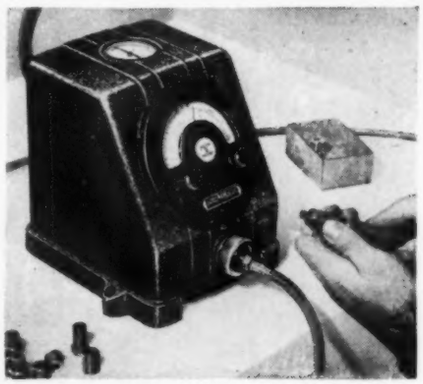
GAGEHEAD—*Yankee Precision Products Co., 50 Bartholomew Ave., Hartford 6, Conn.* An electronic gagehead, the Multiple Lightronic has up to 14 stations, is self-contained, and operates directly from 110-v., 60-cycle, single-phase current.

GAGE BLOCKS—*Johansson Div., Ford Motor Co., Dearborn, Mich.* Sintered tungsten-carbide guard blocks come in thicknesses of 0.100 and 0.050 in. and are available in both A and B standards of ± 0.000004 and 0.000008 in. Guards are wrung onto the end of any "Jo-block" combination.

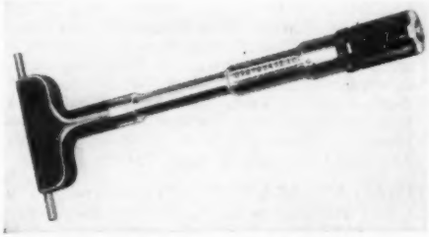
GAGE BLOCKS—*Small Tool and Gage Div., Taft-Peirce Mfg. Co., Woonsocket, R. I.* "A" accuracy gage-block set is made from alloy steel. Blocks are marked for size on edge. Set contains assembly of all 81 standard sizes, as well as an additional 0.100005-in. block.



GAGE—*Nilsson Gage Co., Inc., Poughkeepsie, N. Y.* Nilco dial snap gage is machined from rolled magnesium, and has 45° angles to provide rigidity. A vernier-type adjusting stud permits ¼-in. adjustments to be made in the gaging pin or movable anvil.



AIR GAGE — *Taft-Peirce Mfg. Co., Woonsocket, Rhode Island.* Air gage is 7 in. wide, 8½ in. deep, 7½ in. high, and can be moved to job for spot-checking. Known as the CompAIRator, it has a 180° linear dial, graduated in 0.00005-in. increments. Magnifications are 2500:1.



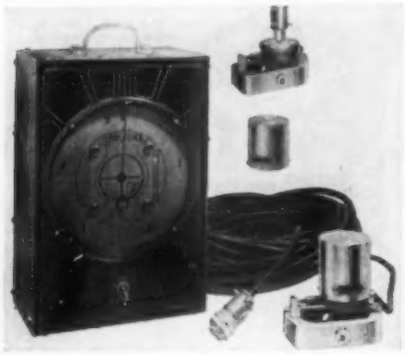
INSIDE MICROMETER — *Richards Machine Tool Co., 124 S. Isabel St., Glendale 5, Calif.* "Rimat" takes direct reading: tool is inserted, measurement taken, pins retracted, tool withdrawn. Made in two sizes, it covers range to 12 in. with use of extra rods.

DIAMETER ATTACHMENT — *The Dow Mechanical Corp., Thompsonville, Conn.* A diameter attachment has been developed for the Dow-Gage internal-length comparator. Diameters can be checked to fractions of 0.0001 in. by screwing in the attachment and adjusting the indicator.

THREAD PLUG GAGES—*Detroit Tap & Tool Co., 8432 Butler St., Detroit 11, Mich.* All standard and special thread plug gages are now precision ground from hardened M-11 chrome-cobalt high-speed steel which is said to have high abrasion resistance, thus reducing wear of gages.

CONTOUR GAGE—*Pratt & Whitney, Div., Niles-Bement-Pond Co., West Hartford 1, Conn.* The Electrolimit contour gage has two-station gaging for checking the cam contour of centerless cam-ground pistons.

LAYOUT and INSPECTION



GAGE—*W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill.* Remote-indication pressure gage and repeater station indicates mechanical pressure in vises, mechanical assemblies and other relatively inaccessible spots. Repeater duplicates to distances of 300 ft. Six models are supplied, covering a total range from 0 to 5000 lb.

INDICATOR—*B. C. Ames Co., Waltham 54, Mass.* The Trutest universal indicator features automatic reversible action which eliminates tripping of a latch in changing from "over" to "under" work. Two contacts, 0.100- and 0.031-in. dia. are furnished with each model. Two models give respective readings of 0.0005 and 0.0001 in.

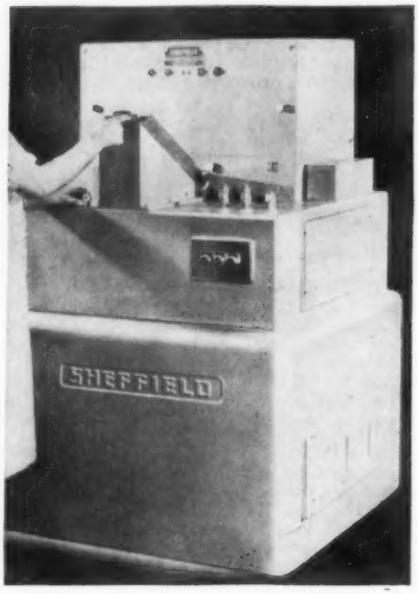
DIAL INDICATOR — *Standard Gage Co., Poughkeepsie, N. Y.* The Micronar quadrant-type dial indicator has standard mounting dimensions. It is suited for use on comparators and on fixtures for controlling close tolerances. The English-unit scale is divided into 0.0001-in. steps.

GAGE—*The Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* MSK-55 needle-type pressure gage shows actual air pressure at the air tool while tool is operating. Gage is inserted in air hose, usually with hose bent, so that it shows pressure in hose at end of tool while tool is under full load.

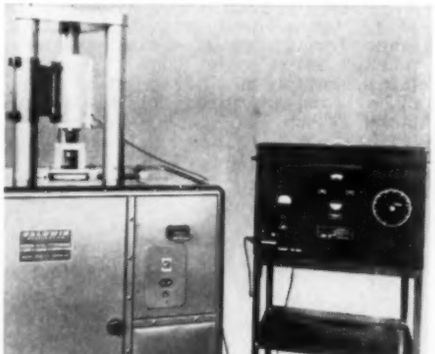
DUPLEX MICROMETER—*Richards Machine Tool Co., 124 S. Isabel St., Glendale 5, Calif.* Rimat takes internal and external measurements. Made in three sizes: 0 to 1, 1 to 2 and 2 to 3. in. Special sizes available to order.

PROFICORDER—*Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Proficorder, a mechanical-electronic shop instrument provides magnified chart record of the shape, height, and spacing of surface irregularities.

MICROMETER STOP—*Keene Valley Engineering Co., Homer, N. Y.* KVE micrometer stop eliminates trial-and-error methods in making screw-machine setup adjustments. Micrometer dial caps one end. Bolt at other end is turned to conform to any adjustment made by turning dial. Correction can be made to 0.001 in. Available in shank dia. of ¾, ⅝ and 1 in.

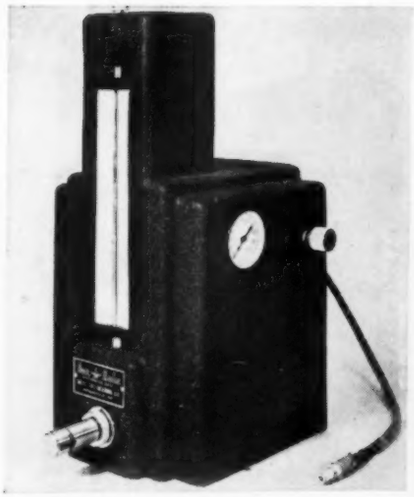


PISTON-GAGING — *Sheffield Corp., Dayton 1, Ohio.* The Airlectric automatic gaging machine checks the average outside diameter of shock-absorber pistons and segregates them into eight classes at the rate of 3600 per hr. Lights if the parts are within minimum or maximum tolerance.



TESTING MACHINE—*The Baldwin Locomotive Works, Philadelphia 42, Pa.* The model SF-4 Sonntag fatigue machine is equipped for tension-compression testing at both ambient and high temperatures. A constant load is provided throughout test. Maximum capacity in either direction is 10,000 lb. Static preload capacity is 0 to 5,000 lb.

WEAROMETER—*Tinius Olsen Testing Machine Co., 599-C, N. 12th St., Philadelphia 23, Pa.* A machine for testing walkway materials, the Wearometer determines surface resistance of wood, linoleum, leather and other materials. A large steel disk, upon which abrasive grain is distributed, revolves at 23.5 rpm. The specimen, connected to vertical shaft which revolves at 32.5 rpm., is lifted and dropped twice in each revolution.



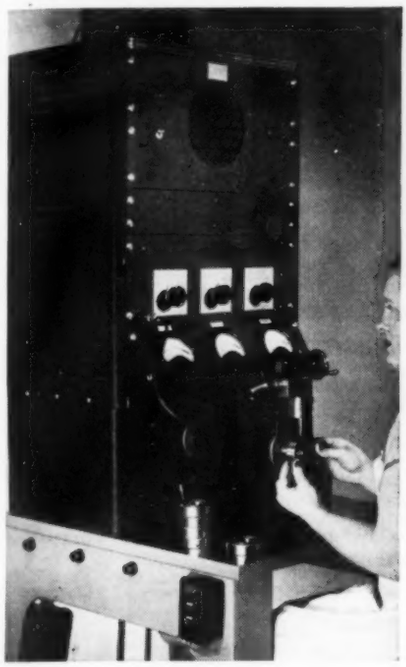
PNEUMATIC AND TAPER GAGES—*Merz Engineering Co., 200 S. Harding St., Indianapolis 7, Ind.* "New-Matic" line of pneumatic and taper gages incorporates "reversed-flow" principle. Gages serve as measuring machines as well as comparators and are made in five models. Illustrated "Master" New-Matic offers any required magnification to 20,000:1. Taper gages consist of two New-Matic gages equipped with a special fixture incorporating large and small taper-gaging rings made of hard steel.

MICROMETERS—*Tubular Micrometer Co., St. James, Minn.* Micrometers with tubular structure have cut weight up to 50%. Conventional micrometers range from 0 to 42 in. Blade types run from 0 to 4½ in., and roller-mill micrometers have a 3- or 6-in. throat depth. Bow-type micrometers with interchangeable mandrels have 0 to 96-in. sizes. Inside micrometers measures 6 to 106 in.

HARDNESS TESTER—*Ames Precision Machine Works, Waltham 54, Mass.* Portable hardness tester measures depth of penetration in materials to test the degree of hardness. A diamond-point penetrator for hard materials and a ball-point penetrator for relatively soft materials are read, respectively, on "C" and "B" scales.

FATIGUE-TESTING — *The Baldwin Locomotive Works, Philadelphia 42, Pa.* A bench-type fatigue-testing machine, the Sonntag Model SF-2 machine gives flexure fatigue tests on sheet stock, including metals, plastics and wood. It can be placed in a cabinet so that atmosphere can be controlled. It weighs 115 lb.

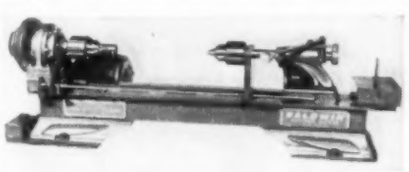
CREEP-TESTING MACHINE — *The Baldwin Locomotive Works, Philadelphia 42, Pa.* A creep-testing machine which incorporates a small furnace tests metals at elevated temperatures to determine creep rate. Maximum possible elongation of specimen is 1¾ in. Capacity is 12,000 lb.



QUALITY RATING — *Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Type BAA Anderometer, a high-speed shop instrument for obtaining over-all quality rating of assembled ball bearings. It measures the height and frequency of radial movements of the outer bearing race as the inner race rotates.

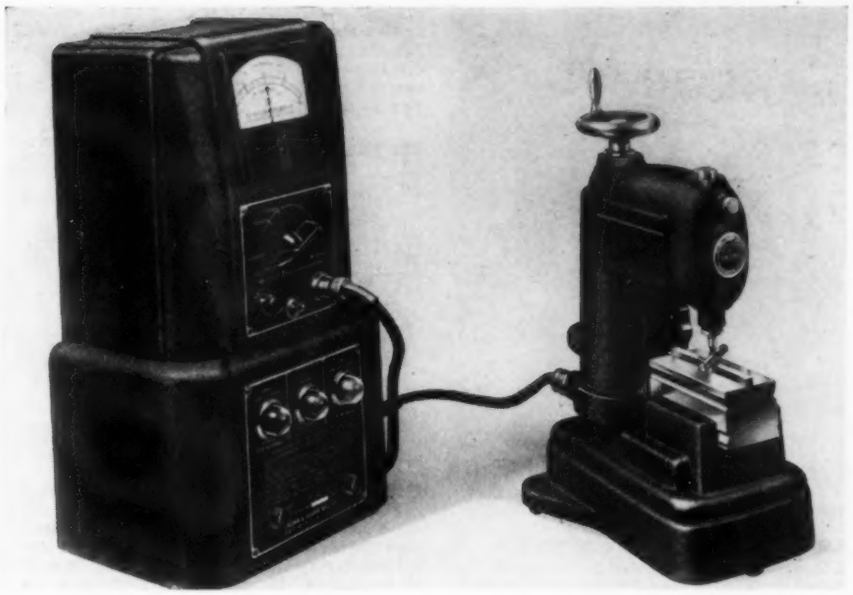
CABLE TESTER—*Allen B. Du Mont Laboratories, Inc., 2 Main Ave., Passaic, N. J.* Cable tester operates on the same core-loss principle as the Cyclograph, but eliminates those features not required for testing wire rope. Equipment consists of main unit and a separate oscillating unit.

PHYSICAL TESTER—*W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago, Ill.* Model 1 tests long specimens as well as those with considerable stretch. Grips are interchangeable to handle tensile, transverse, compression, or shear tests. Model available in 7 ranges: 0 to 25 lb., to 0 to 10,000 lb.

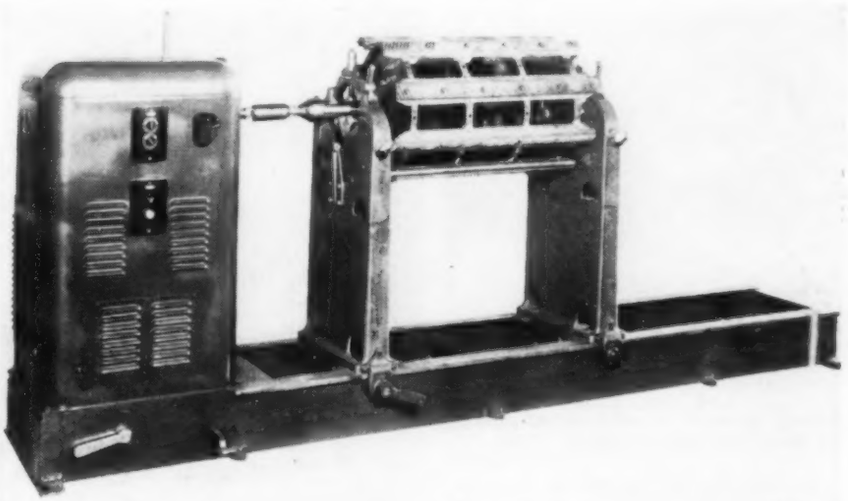


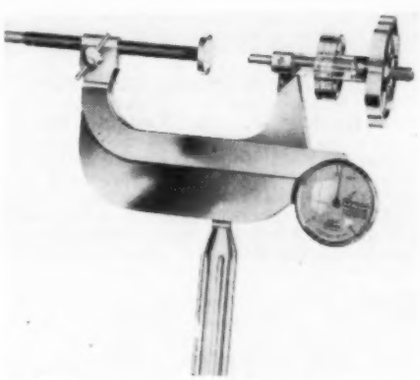
TORSION-TESTING MACHINE — *Sonntag Scientific Corporation; distributed by Baldwin Locomotive Works, Philadelphia 22, Pa.* A torsion testing machine will test wire with diameters from 0.090 to ¾ in. Maximum torque is 1000 in.-lb.

INSPECTION DEVICE — *Sheffield Corp., Dayton 1, Ohio.* "Airlectric Multicheck" inspects and separates 500 to 700 automotive pistons per hr. into eight classifications.



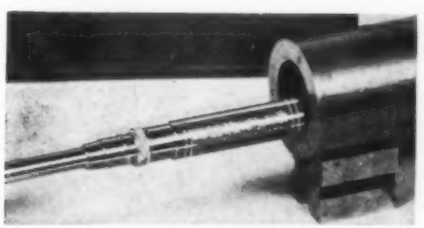
ELECTRONIC MEASURING—*Brown & Sharpe Mfg. Co., Providence, R. I.* Amplifier No. 950 (above left) seated on top of Signal Light attachment No. 958 permits settings from 0.00001 to 0.0001 in. External comparator No. 951 (at right) has a range from 0 to 4 in. and measures by 0.00001 to 0.0001 in. Internal comparator attachment No. 952 (not illustrated) is used with external comparator and is inserted in place of anvil. Range, by means of interchangeable plugs, is ½ to 2 in.



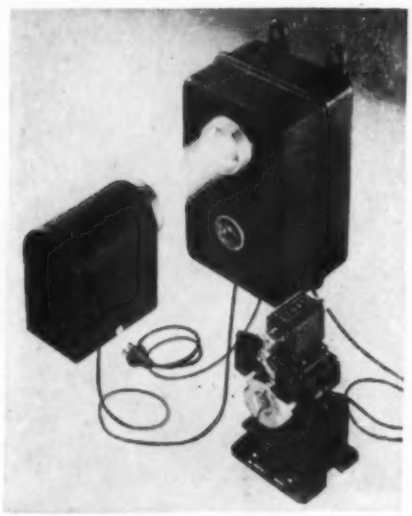


HARDNESS TESTER—*Ames Precision Machine Works, Waltham 54, Mass.* 4-in. capacity portable hardness tester listed as Model 4, the tester weighs slightly over 3 lb. and reads directly in Rockwell hardness scales. Frame is shaped like that of a 4-in. micrometer. Indicator dial has graduations showing when pressures of 60, 100, and 150 wg. are applied.

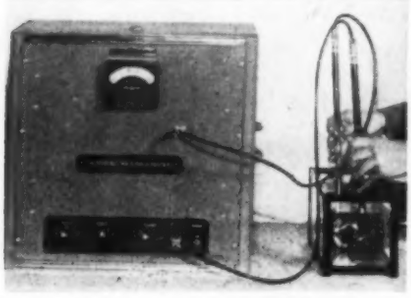
BALANCING—*Bear Mfg. Co., Rock Island, Ill.* Balancing machine for static and dynamic balancing, Model 375-R has a shaft capacity of 1 to 5 in. at bearing point and will swing 60 in. Weights of 50 to 2000 lb. can be balanced.



TRACER—*Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* The Type LA tracer, used with any type Profilometer, will take microinch surface-roughness measurement. It will measure to 36-in. or greater depth in bores as small as ¾ in. I.D.

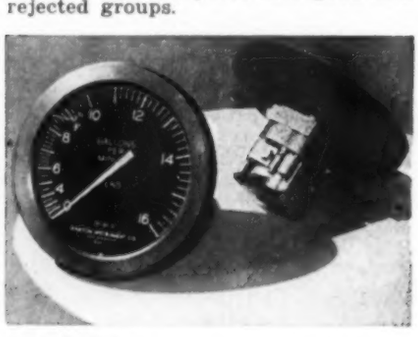


PHOTOELECTRIC COUNTER — *Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.* Photoelectric counter P1, consisting of a photoelectric control, light source and electric counter, takes up to 600 counts per min. Max. number of counts is 99,999 before the counter must be reset. Range is 6 ft.



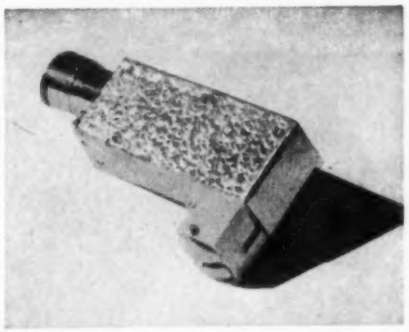
MATERIALS TESTER—*Special Products Div., General Electric Co., Schenectady, N. Y.* An ultrasonic materials tester to indicate flaws in metals, plastics and ceramics sends an ultrasonic wave beam through the specimen and determines, by interpreting changes in mechanical energy, the presence and extent of flaws.

INSPECTION SYSTEM—*Arma Corp., 254 36th St., Brooklyn 32, N. Y.* Automatic inspection system is an electronic light-indicating comparator and handles parts up to 1½ in. sphere size. It automatically inspects, counts, sorts and places parts into good and rejected groups.



INDICATOR—*Barton Instrument Co., 3500 Union Pacific Ave., Los Angeles 23, Calif.* Model 181 Differential Pressure indicator which measures flow, liquid level and pressure differentials has a 6-in. dial, and the differential pressure range is 0 to 50 in. of water up to 0 to 200 psi.

ELECTRONIC COUNTER — *Potter Instrument Co., 136-56 Roosevelt Ave., Flushing, N. Y.* Model 140 single-channel predetermined counter will count and control at rates of 15,000 per min. and higher if required.



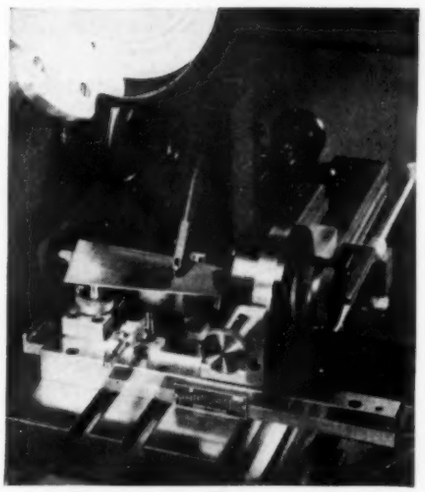
PROFILOMETER TRACER—*Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Type MA tracer developed for Profilometers is self adjusting. Smaller than the tracer it replaces, it will go through a 7½ in. inside diameter hole. No adapters are needed to use the tracer on existing Profilometer units.

SEGREGATOR—*The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Automatic precision segregator, Model DS-20 Selector, is an electronic unit for sorting small parts into three classifications: oversize, acceptable and undersize. Speeds are to 12,000 parts per hr.

TAPER GAGES—*Minuto Gage & Machine Shop, 3408 N. Palethorp St., Philadelphia 40, Pa.* Outside taper gage with Mechanite body incorporates a 4-in. sine bar and two dial indicators. With use of Jo-blocks, tapers to 5 in. per ft. can quickly be measured. The inside gage incorporates a 4-in. sine bar and one dial indicator. With use of Jo-blocks, tapers to 45° can be read.

TIMER—*Cutler-Hammer, Inc., 315 N. 12th St., Milwaukee 1, Wis.* Diaphragm-type timer will provide for either time delay after energization or time delay after deenergization. The timer is said to provide consistent time in intervals ranging from 0.3 sec. to 3 min.

METER—*The R. W. Cramer Co., Inc., Centerbrook, Conn.* Running time meter has counter that can be reset to zero, operates on ac. circuits. Automatically registers total operating time or idle time.



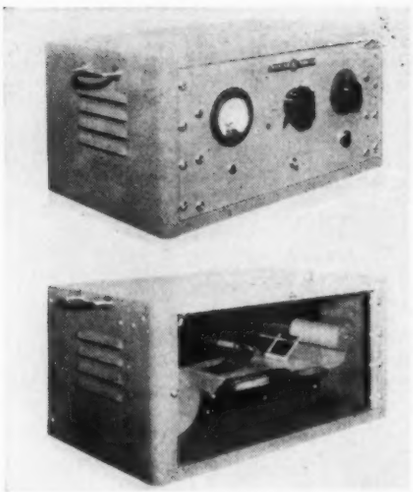
INSPECTION DEVICE — *Engineers Specialties Division, The Universal Engraving and Color Plate Co., Inc., 980 Ellicott St., Buffalo 8, N. Y.* "Pant-O-Jector" is used in conjunction with an optical comparator to inspect blade and bucket profiles on jet propulsion engines. A pantograph arm traces blade contour, and a projector on the arm which has the same shape as the follower is projected on the comparator screen.

REFLECTOGAGE—*Sperry Products, Inc., Hoboken, N. J.* The Reflectogage, utilizes supersonics for thickness measurement and flaw detection. Thickness can be measured where access to only one side is available. Maximum error is said to be less than 2%. Tubing and flat parts from 0.005 to 0.300 can be read directly. Parts to 4 in. thick can be measured.

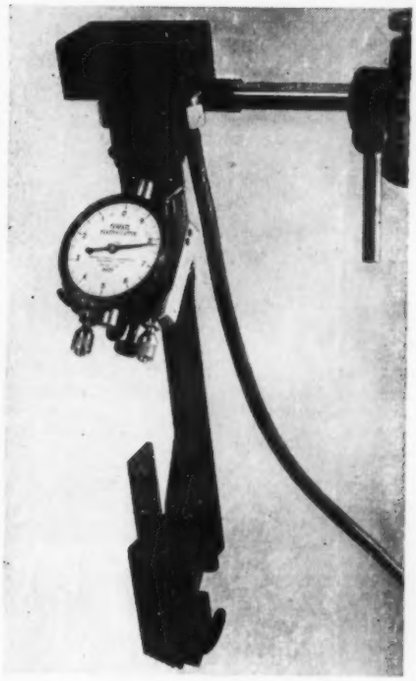
ROLL SELECTOR—*Sheffield Corp., Dayton 1, Ohio.* Automatic hopper-fed unit checks length and two end diameters of small parts such as roller bearings, dowel pins. Parts feed by gravity, are checked by three gaging heads and segregated into four classifications at rate of 3600 per hr.

TRANSMITTER—*The Foxboro Co., Foxboro, Mass.* Model 42, for use in pneumatic transmission of measurements such as flow, static or differential pressure, liquid level, temperature or humidity.

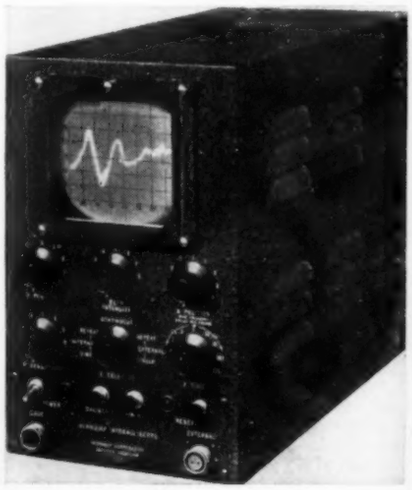
HARDNESS TESTING—*Wilson Mechanical Instrument Co., Inc., 230 Park Ave., New York 17, N. Y.* A heavy-load Model LR "Tukon" hardness-testing machine applies loads from 25 to 50,000 grams. The model tests with either the Knoop or 136° Diamond Pyramid indenter.



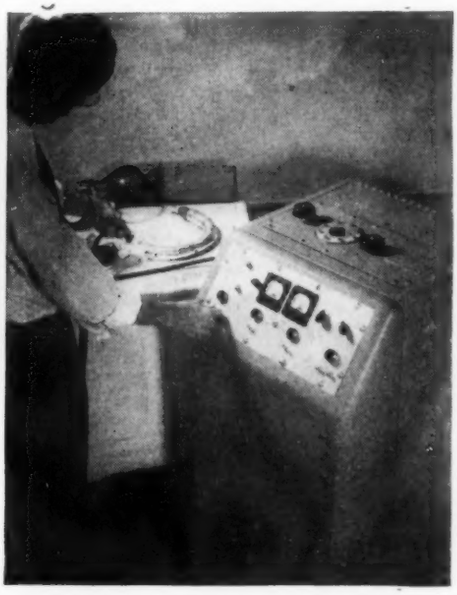
FLAW DETECTOR—*Apparatus Dept., General Electric Co., Schenectady, N. Y.* A flaw detector continuously detects and counts holes, weak spots and conducting paths in sheet material to 0.25 in. thick moving up to 450 fpm. and enamel films on wire moving 100 fpm. It can sound an alarm, shut down manufacture or indicate when flaws exceed a given total.



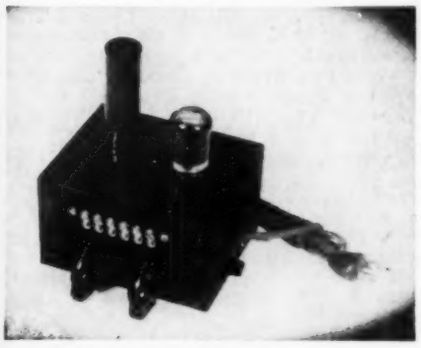
AUTOMATIC CONTROL — *Federal Products Corp., 1144 Eddy St., Providence 1, R. I.* Automatic machine control by application of electronic principles is possible with the Electricator.



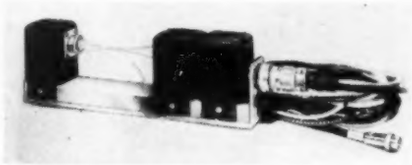
ELECTRONIC ANALYZER — *Aeroquip Corp., Jackson, Mich.* The Hydrauliscope, a device to check pressure surges and other phenomena occurring in hydraulic systems, is a portable high-speed electronic analyser. It gives direct static calibration, linear with pressure and constant.



LEAK DETECTOR—*Consolidated Engineering Corp., Pasadena, Calif.* A portable leak detector that locates and measures leaks in vacuum and pressure systems is said to have accuracy of 0.00000001 cc. per sec. It electronically separates and measures helium molecules, by reason of their mass, from dissimilar molecules in the atmosphere. Six sensitivity ranges give a large range of leakage rate, and the pitch of the audio warning signal is in proportion to the leak size.

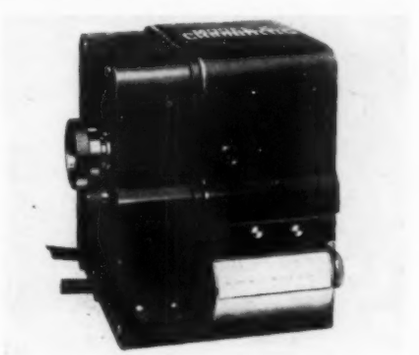


TIMER—*G. C. Wilson & Co., 2 N. Passaic Ave., Chatham, N. J.* Electronic repeat-cycle timer, for process control, life testing, and laboratory use, has independently variable on and off intervals ranging from 0.1 to 4.0 min. Wide variations in line voltage are said to have effect of less than 1% on timing intervals.

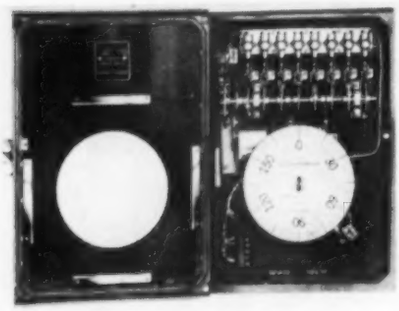


PHOTOELECTRIC ACTUATOR — *Potter Instrument Co., 136-56 Roosevelt Ave., Flushing, N. Y.* The Model 600 photoelectric actuator. The unit detects small, lightweight or irregular shapes at rates up to 30,000 per min. The beam is 1/16 in. wide and responds to changes in light level as small as 20%, and objects as small as 0.010 in. can be counted.

TACHOMETERS—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Two multiple-range electric hand tachometers for measurements in either rpm. or fpm. provide three separate ranges on a 100-division, $3\frac{1}{8}$-in. scale. Type 25A tachometer has ranges of 200 to 2000, 500 to 5000, and 1000 to 10,000 rpm. Type 25B for low speed has ranges of 20 to 200, 50 to 500, and 100 to 1000 rpm.



RECORDER—*National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* Chronolog, Model X, provides accurate records of pieces produced, reasons for down time, their duration, and other incidents which occur during the day.



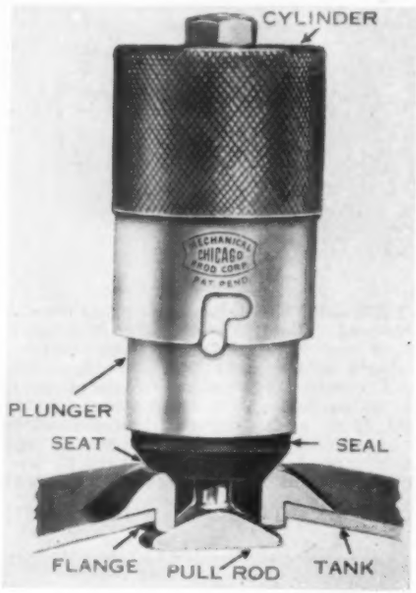
TIME-CYCLE CONTROLLER — *The Bristol Co., Waterbury 91, Conn.* A multiple-cam time-cycle controller known as Model C500 Impulse-Sequence Cycle Controller is used to time mechanical operations in sequence. Notches are cut in a Telechron-driven aluminum disk, and their locations determine the time of operation of the cam mechanism.

BEAM SCALE—*Airdraulics Engineering, Inc., New Canaan, Conn.* The Model SDB-25 beam scale checks accuracy of torque tools including screwdrivers and wrenches, and it tests and adjusts power tools. The scale has a capacity to 25 in-lb.

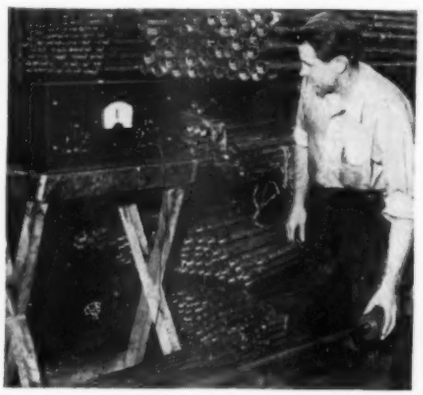
MICROSCOPE—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Toolmaker microscope measures in two dimensions with a range of 2x1 in. It provides erect image in both directions, inclination of the microscope post to the helix angle of threads, and a 30X image on a clear glass reticle.

MICROSCOPE — *Moore Special Tool Co., Inc., Bridgeport, Conn.* A locating microscope for picking up edges, contours, irregular shapes and holes too small for an edge finder or indicator, the operator sees the work in its original position. Magnification is 40X, and the field of vision permits ¼ in. of the work to be seen at one time.

TEST PLUGS—*Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill.* Hydro-Matic self-sealing test plugs, for closing openings in tanks which are to be tested by internal pressures to 500 psi., can be inserted or removed in a few seconds. Plugs are available for ½ to 2 in. standard pipe thread openings.



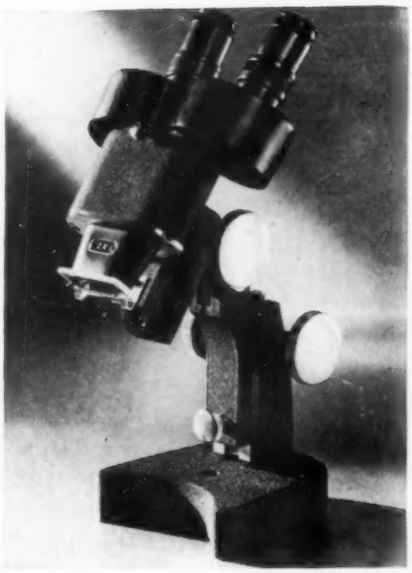
TEST PLUG — *Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill.* "Hydro-Matic" self-sealing low-pressure plug for hydrostatic or air-testing to 100 psi. Used on tanks, boilers and other receptacles for internal testing, it employs a bayonet-lock construction.



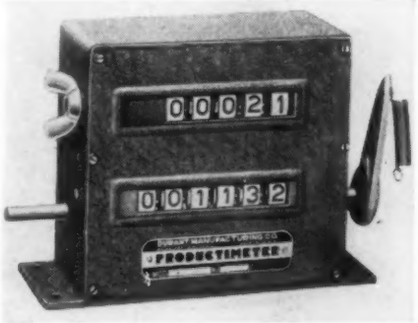
COMPARATOR — *Special Products Div., General Electric Co., Schenectady, N. Y.* Electronic metals comparator provides non-destructive comparison of either magnetic or non-magnetic metal parts with a standard. Can be used to differentiate between annealed and unannealed steel bars, and to sort finished parts.

ADJUSTABLE MAGNIFIER—*Dayton Rogers Mfg. Co., 2835 12th Ave. South, Minneapolis 7, Minn.* A magnifying unit for general tool and die making, spot checking, inspection and general use. The unit has a 1½-in. dia., universal mounting, 2-in. height adjustment, and maximum over-all height of 3½ in.

TACHOMETER—*O. Zernickow Co., 15 Park Row, New York 17, N. Y.* The O-Z stationary tachometer has accuracy guaranteed to be ½ of 1% in either direction.



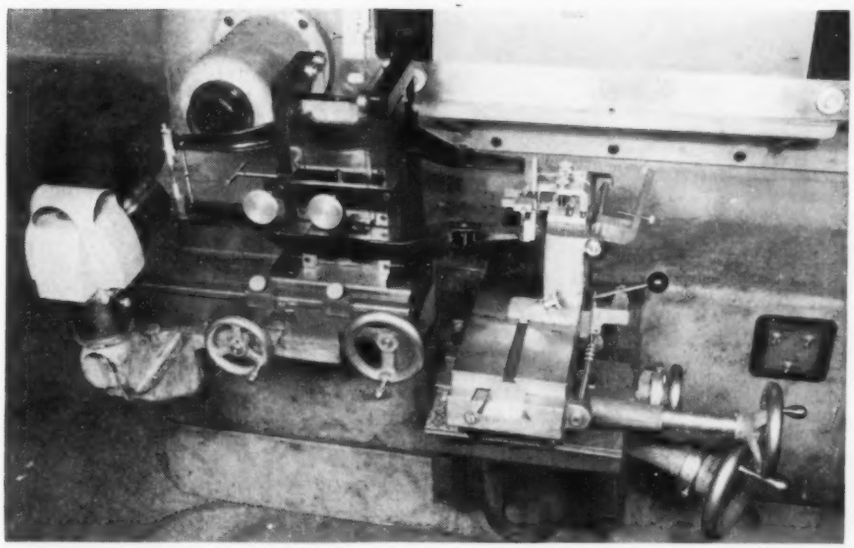
MICROSCOPE—*American Optical Co., Southbridge, Mass.* Spencer stereoscopic microscope, is useful in precision grinding, and other toolmaking, fabricating and inspection processes. Microscope provides both stereoscopic vision and magnification of minute parts. Microscope is supplied in powers of 9, 18, and 27X.



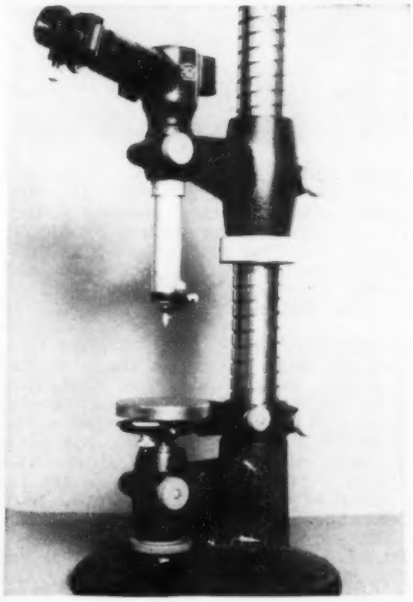
COUNTERS—*Durant Mfg. Co., 1929 N. Buffum St., Milwaukee 1, Wis.* The "N" series double-deck Productimeters, which are rotary and stroke counters, are made in conventional and predetermined types.

TACHOMETER — *Special Products Div., General Electric Co., Schenectady 5, N. Y.* Hand-held electric tachometer, weighing 3 lb., is designed to give readings of linear speeds from 10 to 10,000 fpm., and of rotational speeds from 100 to 10,000 rpm.

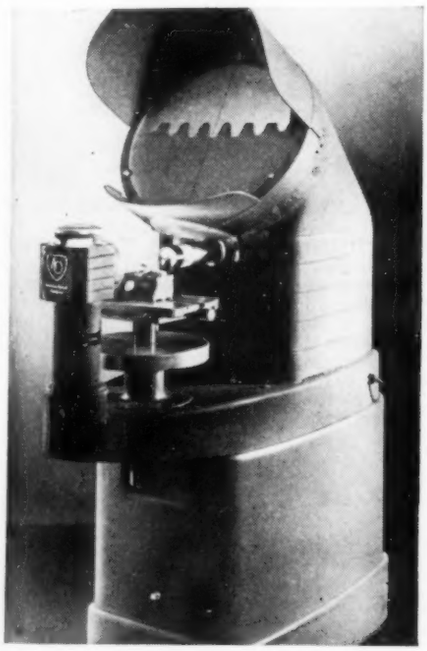
COMPARATOR—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Wilder Optical Comparator, suitable for shadow images in transmitted light and reflected images by surface illumination, is of horizontal design for bench use. Standard circular screen is of 14½-in. dia.



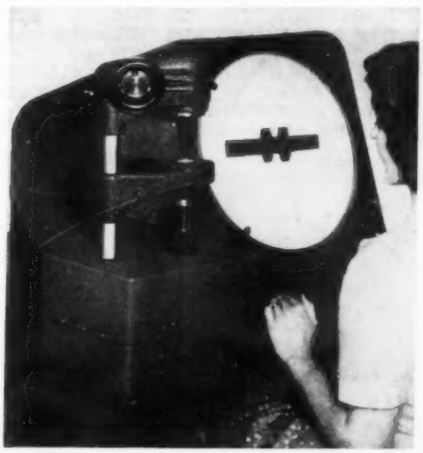
SURFACE COMPARATOR—*Photron Instrument Co., 5713 Euclid Ave., Cleveland 3, Ohio.* Self-contained Pico surface comparator, with a range from 0.5 micro-inch up, consists of meter and exploring head. Comprised of light source, lens system and light-sensitive cell, head is placed on surface to be checked, button is pushed, and reading is compared with prepared standards.



OPTICAL COMPARATOR—*Jones & Lamson Machine Co., Springfield, Vt.* An optical comparator for inspecting jet turbine blades, transfers contours of the sections of a blade optically through a tracing mechanism for comparison with enlarged masters outlined on the receiving screen. The screen is 24 in. high by 30 in. long. Two magnifications are available: 10X for a 3-in. area and 20X for a 1½-in. area.

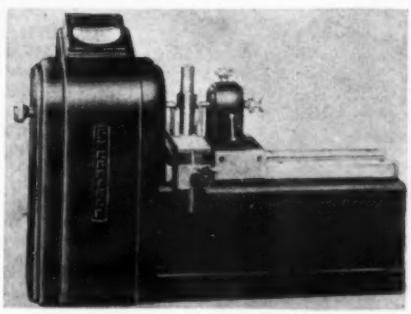


COMPARATOR—*E. Leitz, Inc., 304 Hudson St., New York 13, N. Y.* The SAGEM vertical metallurgical comparator is designed to permit precise comparison of external dimensions. A SAGEM universal comparator sight, Type 1, is used. Inch scales are graduated either 0.00005 or 0.0001 in., with a range of ± 0.004 in. Comparator can also be used with a dial indicator calibrated in 0.01 mm.



COMPARATOR—*George Scherr Co., 200 Lafayette St., New York 12, N. Y.* Wilder projector and optical comparator is suitable for continuous-quantity inspection as well as for the performance of delicate assembly operations on minute parts. Unit offers six magnifications: 10, 20, 31¼, 50, 62½, and 100×. Circular screen has 14½ in. dia.

COMPARATOR—*Engineers Specialties Div., Universal Engraving & Colorplate Co., Inc., Buffalo 8, N. Y.* An optical projection comparator, can be used for inspection of production pieces or, by the addition of a micrometer stage and protractor, as a precise measuring device. Unit features interchangeable magnifications of 10, 20, 31.25 and 62.5X in bayonet mounts. The screen has 16-in. dia. image area.



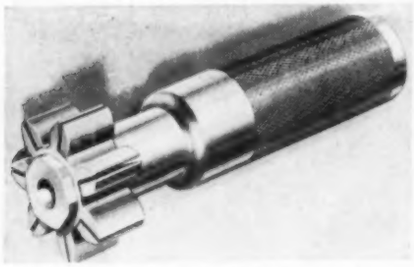
MILLIVOLTMETER — *Taco West Corp., 2620 S. Park Ave., Chicago 16, Ill.* Pyrometric indicator known as Veri-Tell is available in Model 1, which includes thermostatic automatic cold-junction connection; or in Model H with Hyper compensator, useful where narrow or negative scale ranges are required.

TIMER—*Diamond Instrument Co., Wakefield, Mass.* Dico Universal timer operates on 110-v. ac., times multiple operations in sequence or simultaneously. Can time four loads independently within one set cycle.

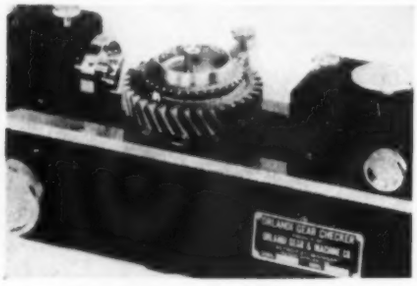
HORIZONTAL COMPARATOR — *Sheffield Corp., Dayton, Ohio.* A horizontal external comparator with capacity for measuring pieces 3½ in. high and 10½ in. long will handle rectangular, threaded or cylindrical parts, tapered and straight. Said to be accurate to millionths of an inch.

UNIVERSAL TIMER—*Gray Laboratory & Mfg. Co., 43 W. Apple St., Dayton 2, Ohio.* Gralab Universal timer times appliances in 1-sec. intervals up to 60 min. It can be used to automatically break or make the circuit at the expiration of pre-selected time or as an elapsed time indicator.

LAYOUT and INSPECTION



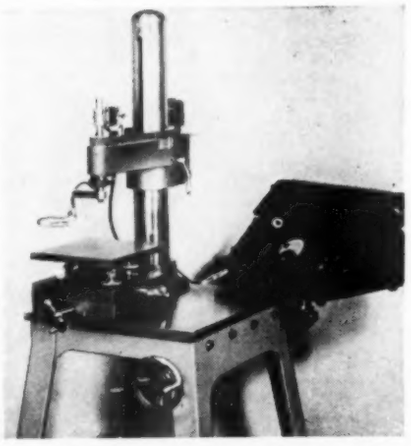
TOOTH FORM—*MP Tool & Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* Adjustable tooth form provides variable thickness of tooth by retaining full profile bearing. Tooth has individual left-side and right-side profiles extending through full width of gear. Profiles are rolled into or away from each other to vary tooth thickness or tooth space.



VISUAL CHECKING—*Michigan Tool Co., Detroit 2, Mich.* Checking of helix angle with Orlandi Gear Checker has been made possible by use of movable, adjustable head, enabling operator to check as rapidly as he can lift one gear and set another on resting plate and locating pin.

SAW-BLADE TENSION — *Simonds Saw and Steel Co., Fitchburg, Mass.* The Simometer measures the tension of power-hacksaw blades, indicating the correct amount for maximum cutting efficiency. It is attached directly to the blade and held by two screws.

GEAR-CHECKING—*Orlandi Gear and Machine Co., 16215 Meyers Rd., Detroit 27, Mich.* A gear-checking machine checks all types of gears with pins and balls, as fast as the operator can lift one gear and replace it on the anvil or locating pin with another. Two machines are available: Model 100-Standard and Model 101-Special. Pitch diameter, concentricity, or the diameter of the gear blank can be checked.

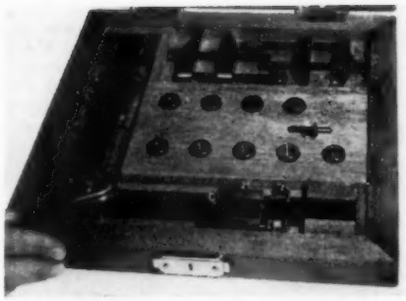


PILOTING FIXTURE — *Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Rotary piloting fixture for circular tracing with a Profilometer permits taking surface-roughness measurements around internal and external surfaces of rotation and on circular flat surfaces.

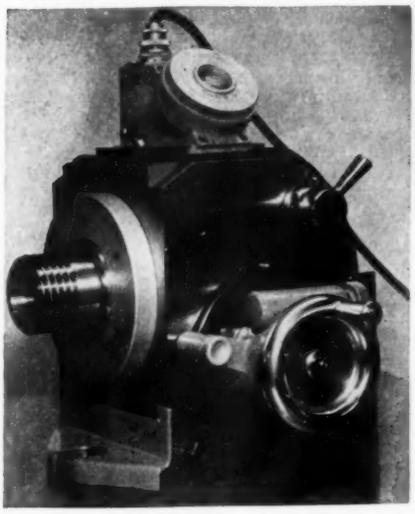
CHROME-PLATE WIRES—*Size Control Co., Div. American Gage & Machine Co., 2500 Washington Blvd., Chicago 12, Ill.* Chrome-plated thread, gear and spline wires combine the long wear of chrome with the elasticity of high-speed steel wires. The longer wear factor means longer retention of the 0.000025-in. initial wire tolerance.

DUAL PROJECTION—*The Faxfilm Co., 1220 W. 6th St., Cleveland 13, Ohio.* A dual-projection unit Model D-30, compares production and standard finishes. Faxfilm process makes plastic replicas of surfaces in less than a minute and produces three-dimensional images at 10- to 200-dia. magnification. In the D-30, images of comparative finishes appear side by side at 30-dia. magnification on a screen.

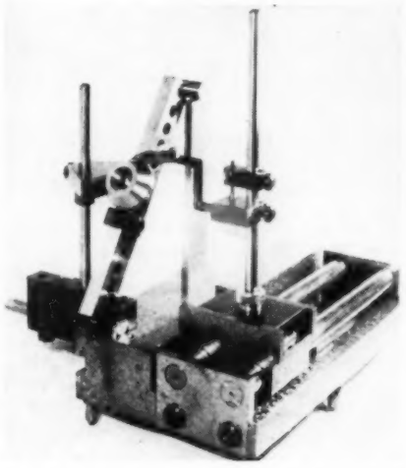
LEAD TESTER —*Pratt & Whitney, Div. Niles-Pond Co., West Hartford 1, Conn.* Model C Electro-Mechanical lead tester checks lead errors of commercial threads. Work up to 10-in. dia. and to 30-in. long can be held between tailstock centers. Longer work with ½- to 3-in. can be held by V-block support. 26 in. of threads can be checked on one setup. Taper and straight threads are checked in the ←same manner.



HOLE LOCATOR—*The Do-All Co., 254 N. Laurel Ave., Des Plaines, Ill.* Holes can be located and drilled on an ordinary drillpress by use of this hole locator. It also checks dies and jigs. To locate a center the locator is laid on the workpiece with the slides acting as stops against the reference sides.



DIVIDING HEAD—*F. T. Griswold Mfg. Co., Lancaster Ave., Wayne, Pa.* Optical dividing head, when used on a milling machine, permits direct selection of any angular division, whether an even degree or not. Also used for inspection of locations usually obtained by means of mechanical dividing heads or indexing machines. Instrument has 12-in. swing.

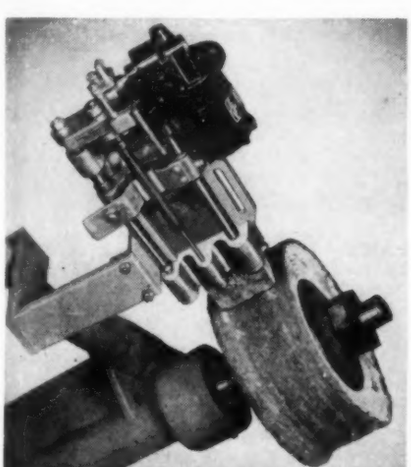


SINE-BAR FIXTURE—*The Patt Brothers Co., 70 Vine St., Willoughby, Ohio.* Fixture checks precision angles and tapers. The sine bar is mounted on a base parallel to the indicator runway.

AMERICAN MACHINIST 35th ANNUAL REVIEW

Cleaning and Finishing

POLISHING LATHE—*Ralph Hochman & Co., 52 Edison Pl., Newark 2, N. J.* The Model 400 polishing lathe for jewelers and other users incorporates the "Washed Air" line. The unit has a self-contained dust-collecting system. Various sizes of ball-bearing 1725-rpm. motors from ½ to 3 hp. are available.



APPLICATOR—*George L. Nankervis Co., 5442 2nd Blvd., Detroit 2, Mich.* Buffing-compound applicator has intermittent feed control of 14 strokes per min. The feed is 0.0015 to 0.015 in. per stroke. Applicator can be mounted on any automatic machine, is driven by enclosed geared-head motor, will take compound sticks to 4 in.

POLISHING BENCH—*H. Leach Machinery Co., 387 Charles St., Providence, R. I.* A self-contained polishing bench has a two-spindle polishing head which will take various types of spindles. Head has direct drive from a 2-hp. motor. A dry dust-collection system is incorporated.

BUFFING COMPOUNDS — *Hydro Chemical Co., 24 Clark St., East Hartford, Conn.* Hydro-Buff 500 series of buffing compounds are non-flammable and are soluble in all proportions in chlorinated hydrocarbons. Series will cut and color in same operation.

TUMBLING BARREL—*D. J. Murray Mfg. Co., Wausau, Wis.* Murco tumbling barrel deburrs, burnishes, cleans, polishes and surfaces metal and plastic parts on a mass-production basis. Speed changes can be made while barrel is in motion, giving a wide range of available speeds.

POLISHING PAD—*Distributed by Wilkinson Equipment Co., 109 E. 69th St., Chicago 37, Ill.* RB Abrading Pads for cleaning and polishing are made of from 2 to 14 plies of abrasive elements die cut in four standard shapes. They come in sizes from ½x2 in. to 9x10 in., and are available from 24 to 320 grit.

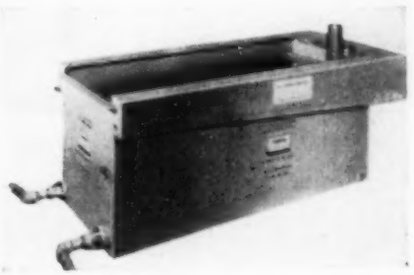
POLISHING LATHES — *Hammond Machinery Builders Inc., 1600 Douglas Ave., Kalamazoo, Mich.* Two single-spindle polishing and buffing lathes have a spindle overhang of 8-in. Model VROL has variable-speed single-V-belt drive with a 3-hp. motor. On 60-cycle current speeds are 1500 to 3000 rpm. On 50 cycle it gives 1250 to 2500 rpm. A hand-operated dial controls speed. Model ROL has single-speed multi-V-belt drive lathe with a 2- or 3-hp., motor. Any single speed from 1200 to 3600 rpm. can be furnished.

BUFFER-POLISHER—*The Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* A 2- and 3-hp. infinitely variable-speed buffing and polishing machine has been redesigned. Nine models, 1 to 15 hp., are available with either enclosed or exposed spindles. Spindle speeds between 1500 and 3000 rpm. are available by "Speedial" control.

POLISHING — *Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* Two 3-hp. or two 10-hp. motors have been made available as part of Type R2V buffing and polishing machines. Each side has its own spindle allowing each workman to operate independently. Speed range is from 1500 to 3000 rpm.

BUFFER - POLISHER — *Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* Extra heavy-duty construction on Proper Speed buffing and polishing lathe to satisfy the increased capacity required when using semi-automatic fixtures. Diameter of spindle between flanges is 2 in. Sizes range: 20, 25, 30, 40 and 50 hp.

BUFFER—*Bradford Machine Tool Co., Cincinnati 4, Ohio.* The Model 660-heavy-duty overhang buffer is designed for long and deep work requiring maximum clearance. It is belt-driven by a ball-bearing motor at 2400 rpm. (or to specifications), and is in a power range from 3 to 20 hp.



GAS-FIRED TANK—*D. C. Cooper Co., 1467 S. Michigan Ave., Chicago 5, Ill.* Unit comes equipped with thermometer, drain, overflow connections. Is used for cleaning metal parts and is available in several models. Tanks can be equipped with steam coils if desired.

ALUMINUM CLEANER — *Optimus Detergents Co., 34 Water St., Matawan, N. J.* A metal-cleaning compound designed especially for cleaning aluminum known as Optimus 101A, is a blend of medium-duty cleaner, including water-softening materials and inhibitors to prevent attack on the metal. It is effective for cleaning dirt, grease and oil.

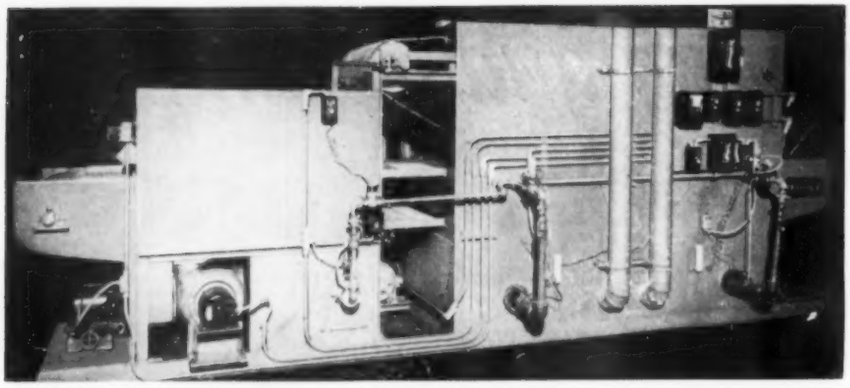
CLEANING UNIT—*L & R Mfg. Co., 577 Elm St., Arlington, N. J.* The Industrial Precision cleaning machine is now equipped with a specially designed motor. The self-contained machine cleans, rinses, polishes and dries parts said to be too delicate for manual handling. Triple nesting baskets are provided so that three sets of parts can be cleaned at once.

CLEANING GUN—*Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.* A lightweight air and water gun, controlled by a finger-tip lever, eliminates the necessity for valve adjustment. It is designed for pressure rinsing and removal of dirt and grease.

HOT-DIP TANKS—*Aeroil Products Co., 5701 Park Ave., West New York, N. J.* Models 5 and 5E Plasto-O-Dip hot-dip tanks for protective plastic skin coatings are equipped with variable-speed mechanical agitation, enlarged pre-melt section, and feeding hopper.

METAL-CLEANER — *Parker Rust Proof Co., Detroit, Mich.* Line of metal cleaners available in three classes: for steel, zinc, and aluminum. Classes include emulsion types, acid types, and alkaline dies. They are formulated to make hard water suitable for cleaning, and to remove soil, rust and grease from metal surfaces.

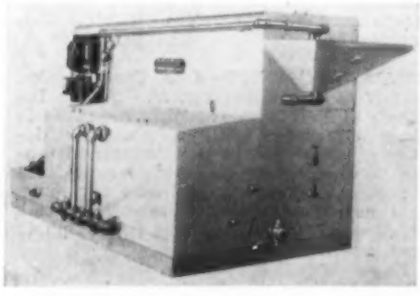
STAINLESS-STEEL PASTE—*Charles Hardy, Inc., 420 Lexington Ave., New York 17, N. Y.* 18-8 stainless-steel paste for corrosion-resistant surfaces is useful where protection against action of acid or salt cannot be handled with ordinary protective coatings. Applied by either brush or spray, paste is available in 4-, 25- and 100-lb. cans.



TRIPLE-STAGE WASHING — *Mabor Co., Clark Township, Rahway, N. J.* Machine processes light, small, cup-shaped stampings of comparatively uniform depth, is gas heated. It washes, rinses and dries parts in three stages.

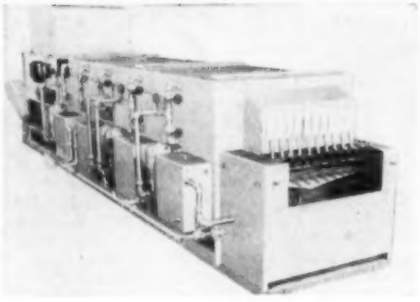
WASHING MACHINE—*Mabor Co., Clark Township, Rahway, N. J.* Unit washes ball bearings, pays particular attention to races. Vertical pyramidal holders accommodate bearings and move on variable-speed conveyor. Races rotated continuously by means of friction strap. Handles 1500 to 3000 bearings up to 6-in. dia per hr.

WASHING MACHINE—*Mabor Co., Clark Township, Rahway, N. J.* A turntable-type washer for rinsing and drying average-sized parts individually or in baskets or trays It is designed in three standard sizes to accommodate sixty baskets per hour.

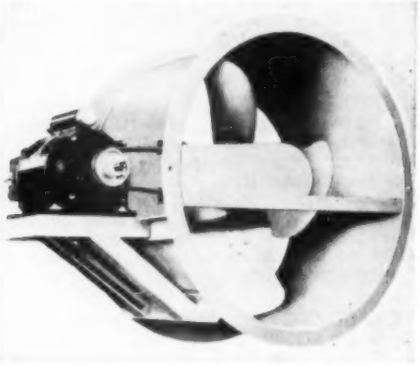


WASHING MACHINE — *Optimus Equipment Co., 151 Church St., Matawan, N. J.* A screw-drum type machine is used for washing and drying metal parts, rinsing and drying them, or any part of these operations. It also can be adapted for a wash drain, rinse drain, cold- or hot-air dry, or for pickling.

CLEANING MACHINE—*Equipment Div., Dept. AM-1, Magnus Chemical Co., Inc., Garwood, N. J.* Redesigned and increased line of Magnus Aja-Dip cleaning machines has drive mechanism located in front. Cleaning is automatic, requiring labor only for loading and unloading. Machines are available in 13 sizes and types and can be used with either hot or cold cleaning solutions.



WASHING MACHINE — *Optimus Equipment Co., 151 Church St., Matawan, N. J.* The WRDXHCF flat conveyor-type washing machine for cleaning and processing metal parts prior to plating. The machine is 35 ft. long, 6 ft. wide and 7 ft. high. Parts go through seven consecutive operations: hot alkali wash, drain, hot water rinse, warm cyanide wash, cold rinse to sewer, hot rinse, dry, in sequence for operating saving. The machine has a belt speed of 4 fpm.



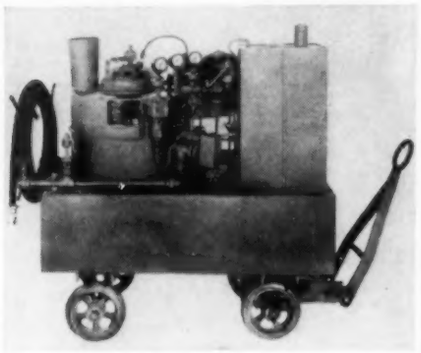
FANS—*Chelsea Fan and Blower Co., Inc., 1200 Grove St., Irvington, N. J.* Series DXB, heavy-duty booster fans, used in paint spray booths, are in five sizes from 16-in. propeller dia., 2000 cfm. and ¼-hp. motor, to 36-in. propeller, dia., 9500 cfm. and ½-hp. motor. Unit is for either vertical or horizontal operation.

CLEANER—*Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.* Pennsalt MC-1 general-purpose inorganic cleaner is a dry, granular material that dissolves quickly in water.

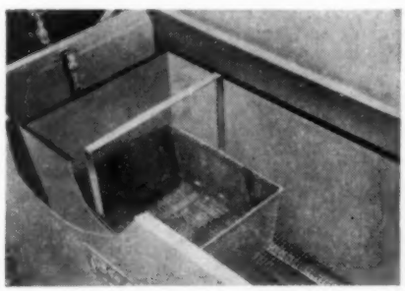
SAFETY CONTROL—*Harper J. Ransburg Co., Indianapolis 7, Ind.* An additional safety device for its electrostatic spray-coating and dip-detearing processes is an electronic "spark-guard" which is able to anticipate an accidental short and de-energize the electrostatic field.

VACUUM CLEANER—*Breuer Electric Mfg. Co., 5084A N. Ravenswood Ave., Chicago 40, Ill.* An improved Tornado portable industrial vacuum cleaner takes up 185 cfm. of air with 49-in. waterlift. It also can be used as a portable blower by removing motor-fan unit and directing it by hand to give a 295-mph. blast of dry air.

SWING TABLE—*American Wheelabrator & Equipment Corp., Mishawaka, Ind.* A 48-in. Swing Table is equipped with 19½ x 2½-in. airless Wheelabrator blast-cleaning unit; is suited for cleaning large fragile work.



STEAM-CLEANING UNIT — *Oakite Products Inc., 124 Thames St., New York 6, N. Y.* An improved Oakite-Vapor unit for cleaning and paint-stripping delivers wet or dry hot vaporized spray under pressures to 200 lb. 12-gal. capacity of the fuel tank provides enough steam generation for 8-hr. 2-gun cleaning cycle.



TANK—*Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.* Turbulator tank is an automatic multi-flow cold-tank cleaner for removing oil, grease, chips and foreign matter that collect on parts during drilling, grinding and similar operations. Working capacities in the four models range from 52 to 765 gal.

CLEANING AGENT—*Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.* Turco Transpo, a rapid cleaner for stripping carbon, paint, oil and other foreign matter from automotive and aircraft engines and parts, is used at temperatures from 65 to 85 F.

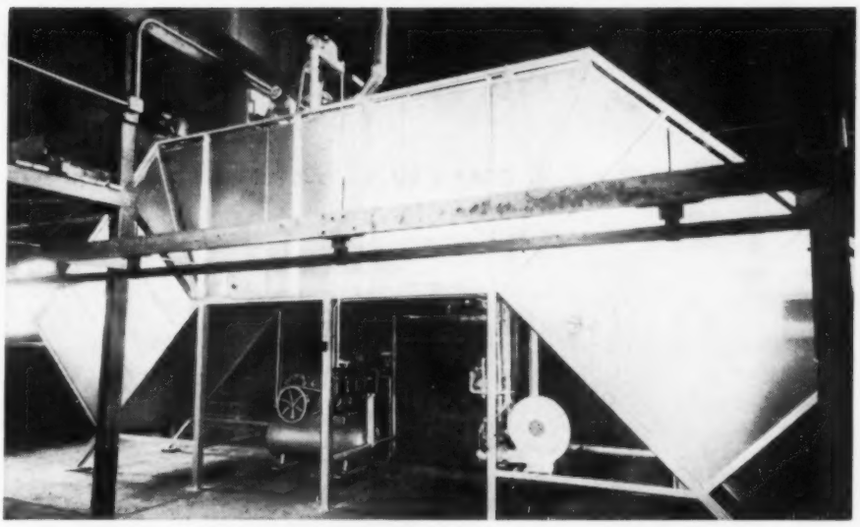
AIR GUN—*Superior Mfg. Co., Cleveland, Ohio.* Bully Blow Gun has a regulating trigger giving controllable air flow from a gentle to a powerful blast and is said to eliminate use of bellows or brush for delicate cleaning jobs.

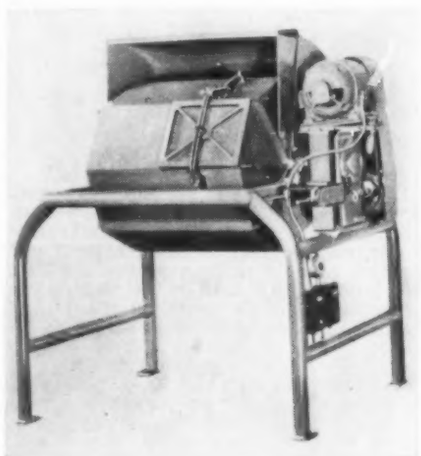
SLUDGE TANK—*Hapman Conveyors, Inc., Detroit 21, Mich.* Unit is self cleaning, incorporates pipe conveyors which have synthetic-rubber flights mounted on sealed pin chains. Made in two sizes with 400- and 3200-gal. capacity.

OXIDE COLORING—*Protective Coatings, Inc., Box 3985, Detroit 27, Mich.* Blu-Blak colors steel at temperatures from 250 to 295 F. Parts are immersed in bath for 15 to 60 min. It is said to penetrate to max. depth (0.0001 to 0.0004 in., depending on hardness) and then color from inside out.

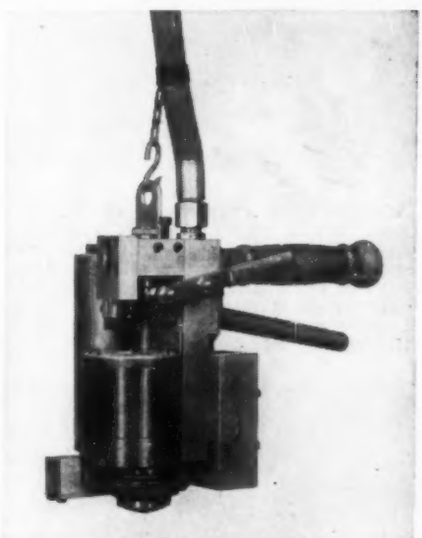
SHAKER SCREEN—*Made by Almco Inc., Albert Lea, Minn.* Unit used with deburring and finishing barrels to separate finished work from tumbling medium. Driven by ½- or 1/3-hp. motor, it vibrates elliptically at 380 reciprocations per min. Movement adjustable to ¾ in. One unit serves 3 or 4 barrels.

ELECTROPLATING RECTIFIER—*Wagner Brothers, Inc., 402 Midland Ave., Detroit 3, Mich.* Wagner-Tiedman electroplating rectifier has a rectifying area of over 4300 sq. in. Selenium-on-aluminum cells, said to take momentary overloads up to 1000%, are employed. Floor area is 5½ sq.ft. and height is 34 in.





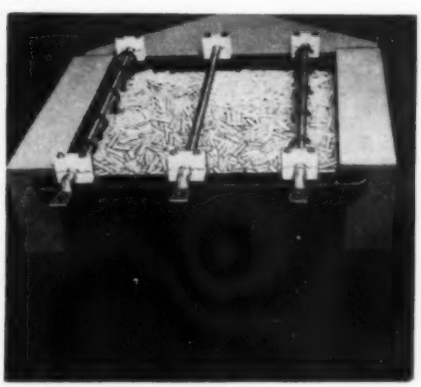
DEBURRING BARRELS — *Almco Inc., 231 E. Clark St., Albert Lea, Minn.* A Line of eleven octagonal deburring and finishing barrels 30-in. dia. and 32- to 60-in. length are unlined or have full neoprene lining. They are motor-driven at 10, 15, 20 or 30 rpm. through a speed reducer.



METAL SPRAYER—*Metaloy Sprayer Co., 135 Liberty St., New York 6, N. Y.* A metal-spray gun that melts and sprays low-melting-temperature alloys provides close control of amount and characteristics of spray. Metal in stick form is inserted through the guide ring. Also can be inserted by ladle and funnel.

INFRA-RED PROCESS — *Burdett Mfg. Co., 3433 W. Madison St., Chicago, Ill.* Gas-fired infra-red burn-off and rustproofing installation takes approximately 5 min. to complete process. With burners in proper relation to work, grease is removed and rust-resistant blue surface is formed simultaneously on metal.

ROTO-FINISH MACHINE — *The Sturgis Products Co., Sturgis, Mich.* Roto-Finish Midget machine for grinding, deburring, polishing, honing and coloring has a controlled rotary action and uses Midget chips and compound to do the work. Cylinders are 8 in. wide and 12 in. across flats. Drive is 35 to 70 rpm.



POLYSTYRENE TUBES — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Chrome spray floats for use in chromium-plating tanks, are laid on the solution to a thickness of about 1 in., forming a blanket to cut spray and conserve heat. The floats are yellow polystyrene tubes, 2¾ in. long.

SPRAY BOOTH—*Monomelt Co., Inc., 1611 N.E. Polk St., Minneapolis, Minn.* Stainless-steel booth for silver spraying objects before electroplating has water spray, air reducer, air-pressure gage, plate-glass baffle, safety valve, and rotating jig for holding objects.

DIAMOND-GRIT—*Industrial Processing Div., Dept. AM-1, Magnus Chemical Co., Inc., Garwood, N. J.* A technique has been developed for the application of diamond grit to the full range of finishing operations. The method utilizes colored, pre-mixed diamond compounds available in paste or stick form.

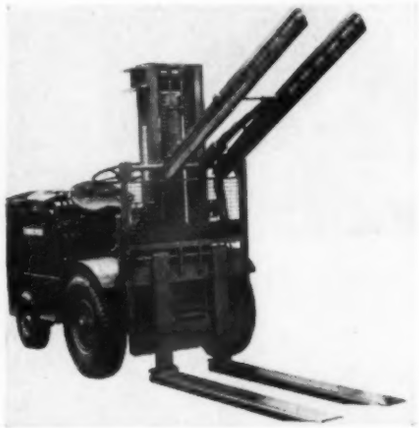
FINISH—*Industrial P-5 Div., The Watson-Standard Co., Pittsburgh 12, Pa.* P-5 anti-corrosive, fast-drying, Co-Polymer finish is recommended for protection of metal, wood and concrete against moisture, acids, alkalies and other agents.

OXIDIZING COMPOUND—*D. C. Cooper Co., 1467 S. Michigan Ave., Chicago 5, Ill.* D. C. Oxidizing Compound for producing uniform black finish on steel parts is an alkaline salt which is mixed with water.

Plant Service Equipment

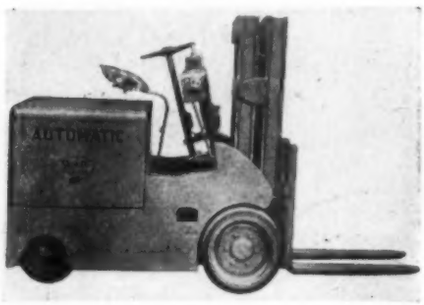
AMERICAN MACHINIST 35th ANNUAL REVIEW

FORK TRUCK—*Clark Tructractor, Div. Clark Equipment Co., Battle Creek, Mich.* Truck has a maximum lift of 120 in. and an over-all height of 83 in. with forks lowered. Driver comfort is emphasized with a sloping floorboard and backrest. Known as the "Carloader," the truck is made in three gasoline models.

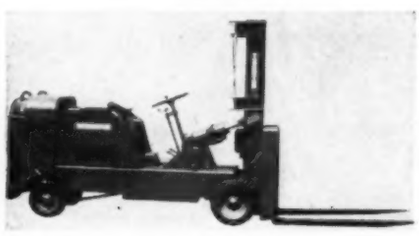


CLAMP-ARM—*Towmotor Corp., 1226 East 152nd St., Cleveland 10, Ohio.* Accessory for fork-lift trucks has sponge rubber inserts along bottom edge of arms which are said to prevent shifting or slipping of large flat loads. Capacity of this unit is 4,000 lb. at 25 in.; lifting range is 114 in.

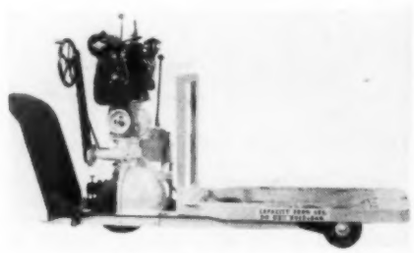
JACK TRACTOR — *Lewis-Shepard Products, Inc., 297 Walnut St., Watertown 72, Mass.* The JackTractor unit, an addition to the platform and pallet models of the power Jacklift, is built to tow trailer trains and can also be used as a pushing unit. It has a max. draw-bar pull of 500 lb.



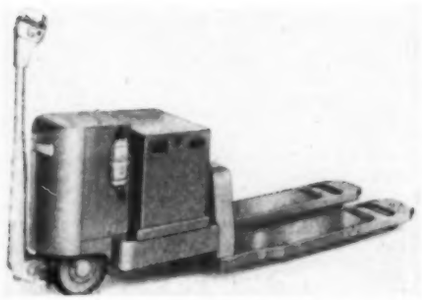
SKYLIFT—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Unit is capable of tiering to truck and trailer ceilings as low as 68 in., yet has total lift of 100 in. for storage-area stacking. Made in capacities of 2,000, 3,000 and 4,000 lb.



FORK-LIFT TRUCK — *Towmotor Corp., 1226 East 152nd St., Cleveland 10, Ohio.* Model LT-90, with a lifting capacity of 15,000 lb., can be used for heavy industry, and can also be used in conjunction with Towmotor accessories.

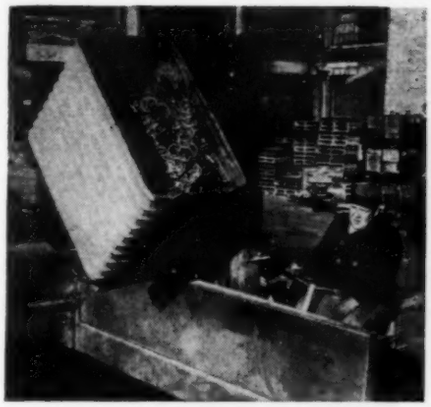


TRUCK—*TruckMan, Inc., 1410 W. Ganson St., Jackson, Mich.* Two speeds in forward and reverse on Model D 1-ton capacity truck. It turns in 84½-in. radius, is 101½ in. long with platform down. Lift is hydraulic.

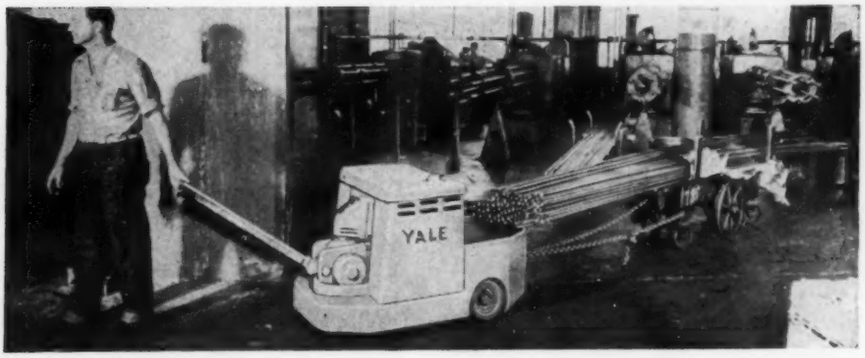


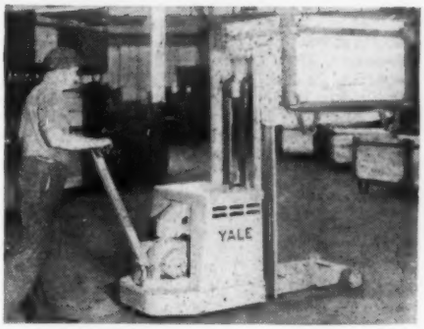
LIFT TRUCK—*Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio.* The Model K Hydroelectric motorized lift truck is made in pallet and platform styles in a variety of sizes. All units have 4,000 lb. capacity and two forward and two reverse speeds.

PUL - PAC DEVICE — *Clark Tructrator Div., Clark Equipment Co., Battle Creek, Mich.* The Pul-Pac attachment for handling loads without pallets with Clark fork-lifts. Loads mount on sheets of paperboard, fiberboard or other material instead of wood or metal pallets. To load, a hydraulically actuated gripper clamps an extending margin of the sheet and pulls sheet and load onto a steel plate. To unload, a pusher device works against load.



FORK-ROTATING MECHANISM—*Clark Tructractor, Div. Clark Equipment Co., Battle Creek, Mich.* Unit dumps scrap from tote box into truck. Can also be used for handling of rolls. It is operated by hydraulic motor and gear reduction, and is adaptable to fixed or adjustable forks, scoop or other special attachments.

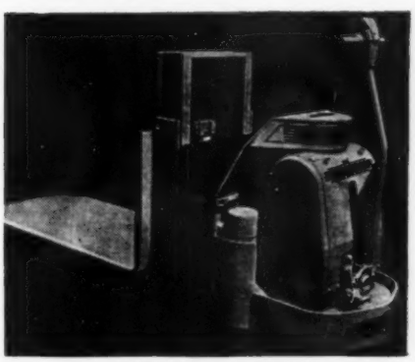




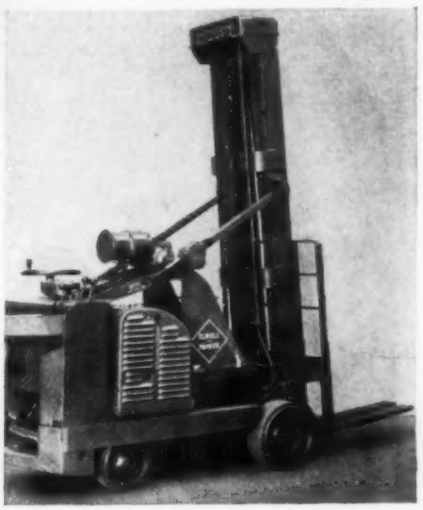
HANDTRUCK—*The Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Electric power provides lift and movement, while the operator steers this handtruck. One model gets under a 7-in. skid and hoists it 66½ in. The other gets under 11-in. skid and hoists it 70½ in. Both have a 4000-lb. capacity.

TOWING UNIT—*Philadelphia Div., Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Worksaver Tractor for heavy ungainly trailer loads has three wheels with 5-in. rubber tires. Short turning radius made available by 30-in. distance between front and rear axles. Powered by electric storage battery, guided by operator.

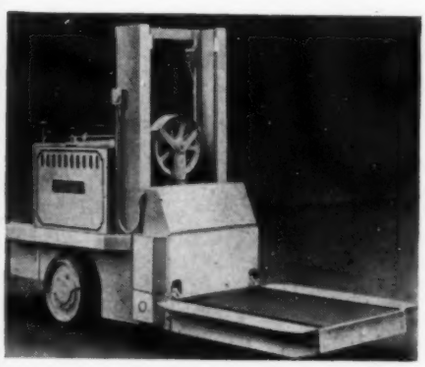
MOBILIFT—*General Equipment Co., Portland, Ore.* The Model F Mobilift lift truck has a rated capacity of 3,000 lb. on a 15-in. load center. The unit has 20-hp. three-cylinder air-cooled engine. Weight is 4,450 lb. No gear shifting is required. Overall turning radius is 61 in.



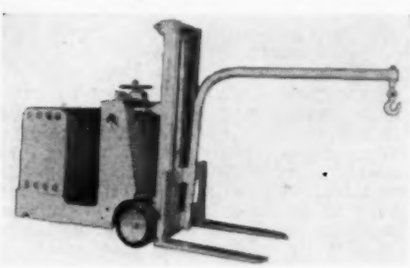
TRANSPORTER—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Hyskid Transporter makes it possible to handle skid platforms of all heights with a single all-purpose motorized handtruck. It will raise a full-capacity load of 6000 lb. at a rate of slightly more than 1 in. per sec.



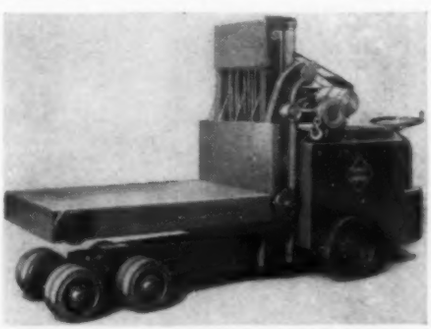
FORK TRUCK—*Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.* Unit has elevating reach to 18 ft. above floor level. Capacity is 4000 lb. up to 11 ft. and 3000 lb. to 18 ft. Body is 7 ft. 8 in. long. Truck driven electrically by three motors; one for traveling, one for elevating, and one for tilting the upright column.



DIE-HANDLER ASSEMBLY — *Mercury Mfg. Co., 4118 Halsted St., Chicago, Ill.* A die-handler assembly is built into "Mogul" 5-ton High-Lift chassis. It also can be on a 3-ton chassis in either high or low lift models. Two independently controlled, pushbutton-operated die movers operate in slots at the platform sides.



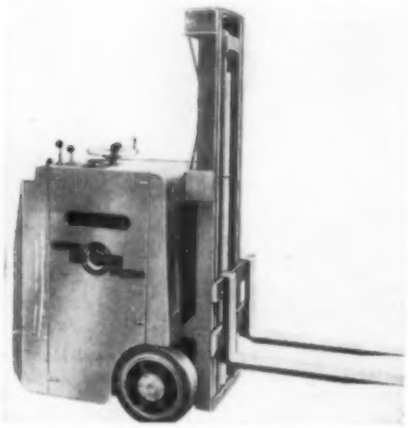
CRANE-ARM—*Lewis-Shepard Products, Inc., 301 Walnut St., Watertown 72, Mass.* Attachment is built in standard models in increments of 6 in. from a minimum length of 24 in. to a maximum of 72 in.



POWER TRUCK — *Elwell-Parker Electric Co., Cleveland, Ohio.* A 25-ton capacity die-handling power truck has a platform 53 in. wide and 72 in. long. To load a die, the platform is elevated to the level of the press bed. Cables wound on power-operated reels are passed under the pulleys on the upright column and are hooked together at the far end of the die. The cables are reeled in, sliding the die onto the platform.

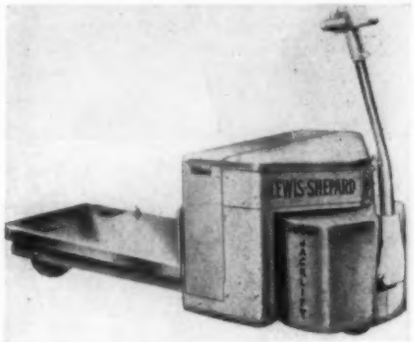
TRUCK — *Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* The 1947 model Transporter with the Atco electric lift, a hand-truck operating with a standard 11-plate battery, has controls arranged for one-hand regulation. Also announced is 1947 model Atco foot lift. Both electric and foot-lift trucks come in 4000- and 6000-lb. capacity on pallet models.

POWER JACKLIFT — *Lewis-Shepard Products Inc., 248 Walnut St., Watertown 72, Mass.* Vertical-handle operation and an electric brake are featured in platform- and pallet-model power jacklifts. They are hand lift trucks electrically controlled by pushbuttons located in the handle head.



PALLETIER—*Crescent Truck Co., Lebanon, Pa.* The Model LVGH-X Palletier has an electric fork-lift truck, and can stack 42x32-in. pallet loads at a right angle in 8-ft. aisles. Capacity is 2000 lb. with 36-in. length of load.

TOWING TRACTORS — *Clark Tructractor, Battle Creek, Mich.* Improvements in the Clarkat towing tractor include: wider steering axle; pneumatic or solid tires; center-pivoted suspension of steering axle; mechanical speed-control governor.



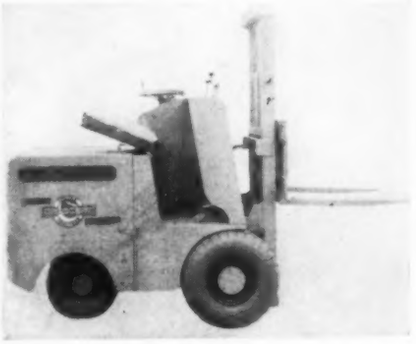
JACKLIFT—*Lewis-Shepard Products Inc., 293 Walnut St., Watertown 72, Mass.* A 6000-lb. platform-model power Jacklift, completely electric, retains all the features of the 4000-lb. model. It is controlled entirely from handle head and can be operated with handle in any position.

TRUCK—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Hand-guided fully powered electric Worksaver truck, with a tilting-fork unit, is small enough for work in corners. It lifts 3000 lb. with load not over 28 in. long, and 2000 lb. if load is 48 in. long. It hoists to a height of 58½ in. and tilts 21°.

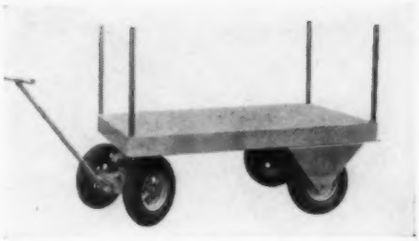
ELECTRIC TRUCK — *The Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* A gravity-tilting-platform type electric truck designed for manipulation of heavy machinery and crates utilizes a roller-ramp, cable-draw system.

DUMP BOX—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* A drop-bottom skid dump box for use with any standard fork truck can be placed beneath equipment where loose materials are made or accumulate. When filled, it is picked up like a skid platform. When truck forks are lowered, the hinged bottom automatically opens.

TRUCK—*Baker Industrial Truck Div., The Baker-Raulang Co., 2168 West 25th St., Cleveland 13, Ohio.* Type FQH-10, center-control fork truck of 1000-lb. capacity, is used where floor space is limited or areas are congested. It has over-all length, exclusive of forks, of 53⅝ in., takes a 1000-lb. load 30 in. long.



LIFT TRUCK—*Crescent Truck Co., Lebanon, Pa.* The electric Palletier, model LGVH, has all controls available to the driver's fingertips. In 2000-lb. capacity size, it has magnetic-contactor controller. In 1000-lb. size, it has a choice of cam-operation controller or magnetic controller. The truck has hydraulic lift and tilt.



TRUCK—*Market Forge Co., 25 Garvey St., Everett, Mass.* Indoor-outdoor pneumatic-wheeled truck has a rated capacity of 2500 lb. and a height above floor of 22 in. It is 30 in. wide and has 60-in. long loading space.

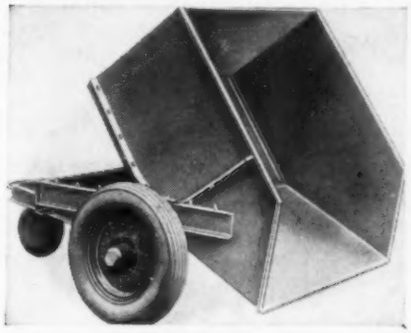
HEAVY-DUTY TRUCK—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Designed for shops where continual moving of heavy dies, jigs or fixtures is necessary.

HAND TRUCK—*Made by Mercury Mfg. Co., 4114 S. Halsted St., Chicago 9, Ill.* All-aluminum trailer weighs 175 lb., has 2000-lb. capacity. Standard platform is 3x6 ft. and 14½ in. high. Platform size can be varied. Wheels are 10x2½-in.

HANDTRUCK—*Sage Equipment Co., 110 Auburn Ave., Buffalo 13, N. Y.* All-welded unit has large noseplate, rubber-tire ball-bearing wheels, weighs 43 lb. handles loads to 500 lb. Overall height is 51 in., width at nose is 14½ in.

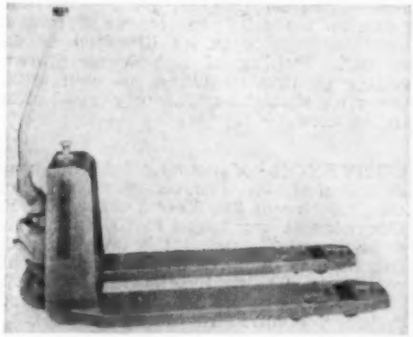
BUGGY — *Smyrna Industries, Inc., Smyrna, Ga.* Industrial handling buggy weighs 12.5 lb., is 27.5x17x27 in. high and is all-aluminum. Handles loads to 300 lb. Decks are designed to take trays, boxes, or to handle pallets.

NEOPRENE TIRES — *Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Neoprene tires are standard equipment for drive wheels of motorized hand trucks made by Automatic, and as special equipment for load wheels. Neoprene is said to have low rolling resistance, and longer life than crude or other synthetic rubbers.

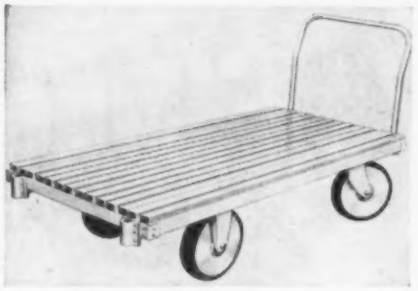


TRAILER TRUCK—*Phillips Mine and Supply Co., Pittsburgh, Pa.* Phil-Dump trailer truck has a roll-over type body, chain release, and quick return. Is equipped with pneumatic tires and optional center caster.

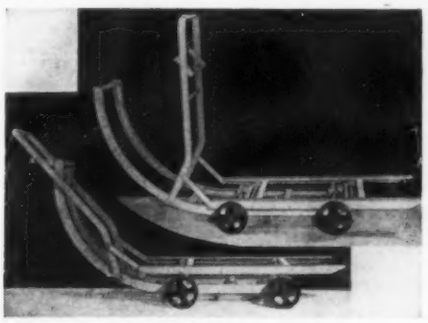
PALLET TRUCK — *Lyon-Raymond Corp., 3173 Madison St., Greene, N. Y.* A 2000-lb. capacity hand pallet truck has lightweight construction. A hydraulic foot pump with optional length stroke drives the elevating mechanism.



PALLET TRUCK — *Lewis-Shepard Products, Inc., 328 Walnut St., Watertown 72, Mass.* The Multiple Stroke hydraulic pallet truck is equipped with plastic wheels, to save wear and tear on floor surfaces, and is of lightweight construction. Hydraulic lift is from a selective-stroke-length double pedal. Capacities are from 1000 to 6000 lb.



TRUCKS — *California Pallet Div., Tobey International Co., 7005 S. Western Ave., Los Angeles, Calif.* Aluminum-alloy trucks made in three sizes take rolling loads from 2000 to 5000 lb. depending on 6- to 12-in. caster size. Special handles and automatic couplings available.

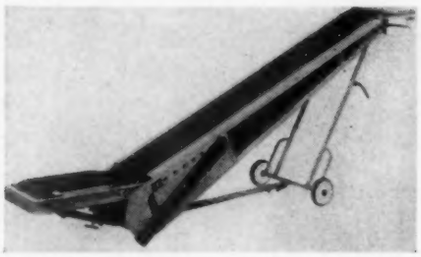


HAND-LIFT TRUCK—*Arcade Mfg. Div., Rockwell Mfg. Co., Freeport, Ill.* Truck takes loads up to one ton. Of light construction, it has 70-in. overall length, 13¾x43-in. platform area.

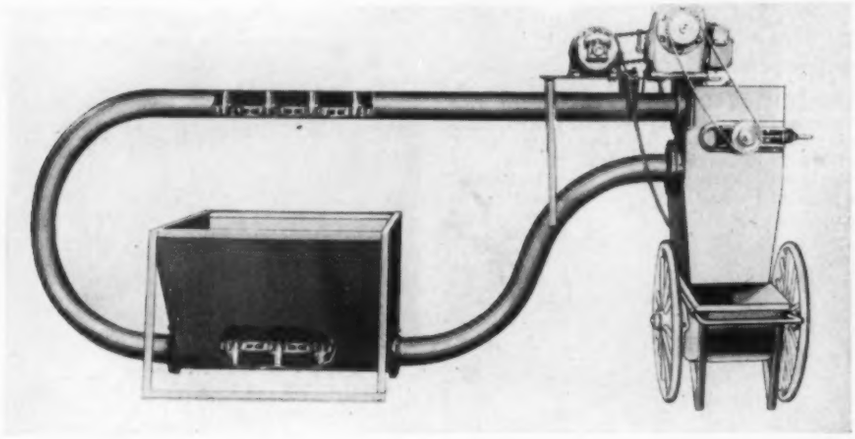
HANDTRUCK—*Thermoid Co., Trenton, N. J.* A general-service heavy-duty hand-truck has light aluminum construction, 7-in. steel nose and solid "cut-resistant" rubber-tired ball-bearing 9-in. wheels. The truck is 53 in. high x 18 in. wide. Thermoid also makes a line of 6-, 8-, 9-, 10- and 12-in. aluminum wheels.

HAND TRUCK—*Easy-Tote Products, Inc., Arcade, N. Y.* Departmental truck accommodates standard tote pans. Loading is accomplished by tilting the plate and by operating the crank and handle.

BELT CONVEYOR—*Steel-Parts Mfg. Co., 222 S. Morgan St., Chicago, Ill.* Stainless-steel links are applied to any standard-model all-steel belt conveyor. "Indian grip" connects links so they may be easily removed. Conveyor is made in standard 5- or 10-ft. removable sections.



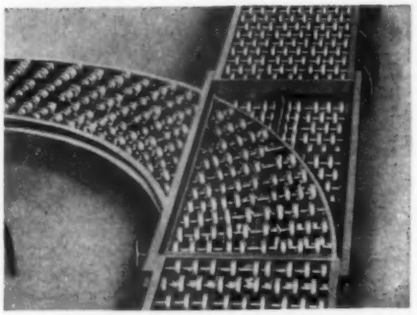
BELT CONVEYOR—*Arrow Products, Inc., 343 Indiana Ave., N.W., Grand Rapids, Mich.* The Ele-Veyor, a lightweight, portable power belt conveyor can handle packaged or bulk material, small parts or hot forgings, allowing them to cool on the belt. Available in 6- or 8-ft. length, with 8- or 12-in. belt width respectively, both models take 300- to 600-lb. distributed load.



CONVEYOR—*The Honan-Crane Corp., 909 6th St., Lebanon, Ind.* Houdaille conveyor is used for automatic removal and transfer of sediment from settling tanks without removal of fluid. Speed is 2 to 3 fpm.

LOAD-VEYOR — *Market Forge Co., Everett 49, Mass.* Standardized Load-Veyor made entirely of aluminum has Grid-like structure which provides greater strength in all direction. A 10 ft. unit weighs 30 lb.

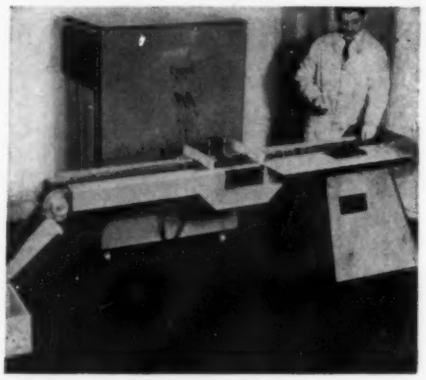
CONVEYOR — *The Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* A lightweight aluminum gravity wheel-type conveyor is made in 5, 6, 8 and 10 ft. lengths in one width of 12 in. Standard self-locking hook and bar couplers permit coupling to other Rapids-Standard material-handling equipment.



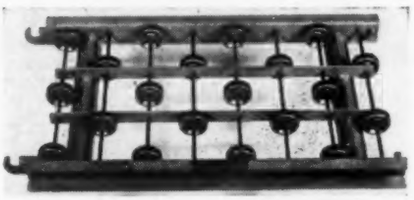
SWITCH—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Switch permits material to travel forward on conveyor or to be diverted at 45 or 90°. Pulling of a lock-pin allows center portion to swing on own axis, allowing straight-ahead or curved side to be used.

CONVEYOR—*Mercury All Aluminum; distributed by Patron Transmission Co., 129 Grand St., New York 13, N. Y.* Operates at any speed to 100 fpm., has capacity of 250 psf. It is shipped prefabricated in 5-ft. sections. Widths are 6 to 60 in. height is 15-in. up. Standard equipment includes speed reducer, electric reversing control.

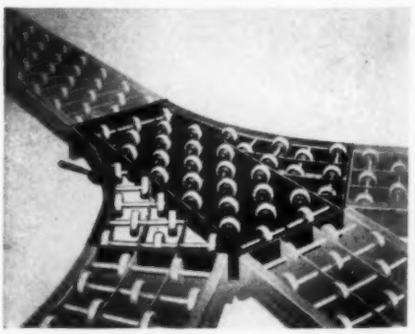
BELT CONVEYOR—*Rapids Standard Co., Inc., Dept. PV-3, Grand Rapids 2, Mich.* Used between punch-press machines where space must be conserved, the Press-Veyor is made in three models. New model has 4-ft. long conveyor bed, is powered by 1/3-hp. electric motor. Receiving end adjusts from 9 to 30 in.



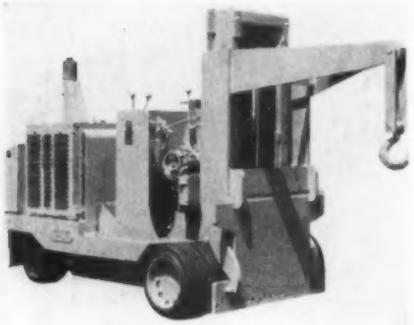
CONVEYOR TABLE — *Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23, N. Y.* A conveyor-belt table used in conjunction with any induction heater, handles parts for operations such as brazing, annealing, soldering and hardening. The belt is powered by ¼-hp. motor.



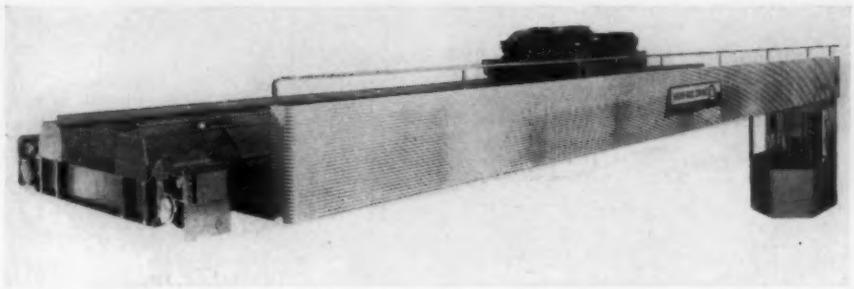
CONVEYOR SECTION—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Unit comes in 5- and 10-ft. lengths, can be hooked without use of tools by one man. Three sizes are 12, 14 and 18 in. wide.



THREE-WAY SWITCH—*E. W. Buschman Co., Inc., Cincinnati 32, Ohio.* Switch for roller conveyors pivot wheels in center portion has controlled single lever.

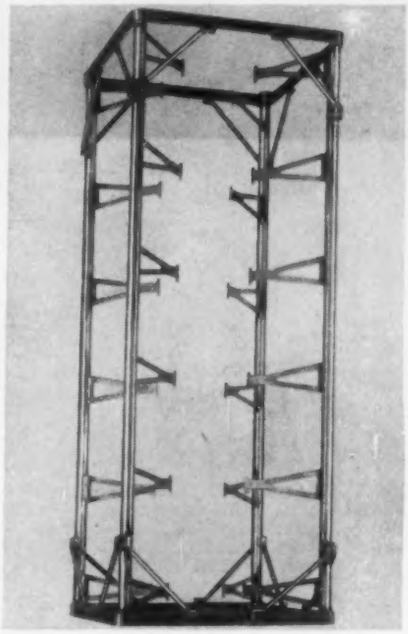


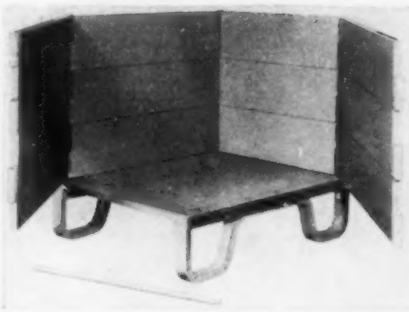
ATTACHMENT—*Yale and Towne Mfg. Co., Philadelphia, Pa.* Boom-and-hook attachment used in foundries, automotive plants and other heavy industries has an outreach of approx. 4 ft. lifts to 18,000 lb.



STREAMLINED CRANE—*Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc., Muskegon, Mich.* 10-ton capacity "Shaw-Box" overhead-traveling crane has approximately 55-ft. span, incorporates color-safety painting. Sheathing along platform serves as guard against anything dropping to floor.

PORTABLE CRANE—*Revolvator Co., North Bergen, N. J.* A folding portable crane, which can be moved under low doorways, is equipped with a low gear for heavy loads. Maximum capacity is 4000 lbs.



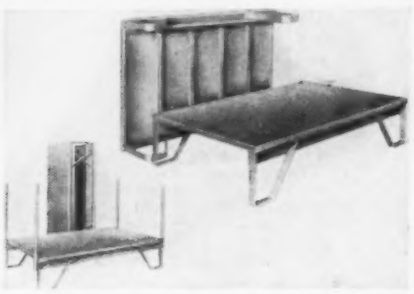


COLLAPSIBLE BOX—*Market Forge Co., Everett 49, Mass.* A collapsible metal box for use with skid platforms is made up of panels provided with steel loops which slip over removable platform corner posts.

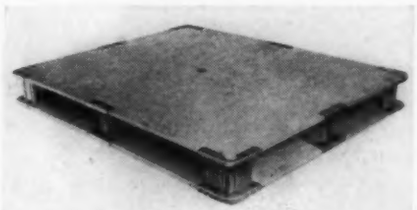
ALL-METAL PALLET—*Palmer-Shile Co., Dept. K, 16019 Fullerton Ave., Detroit 27, Mich.* Unit with nesting ring can be used with power truck or hand truck.

HANDLING FIXTURE — *Stanwood Corp., 4819 W. Cortland St., Chicago 39, Ill.* Lightweight fixture for handling six dished tank heads for hot-water heaters as they pass through porcelain-enameling furnaces. When stresses set up warpage in one direction, the fixture can be inverted.

ALL-WELDED PLATFORMS — *Phillips Mine and Mill Supply Co., 2227 Jane St., Pittsburgh, Pa.* Phil-Skid, an all-welded steel-construction platform with heavy corrugated steel deck handles heavy castings, scrap and other industrial products. Absence of screws and bolts protects loads from tear or score.

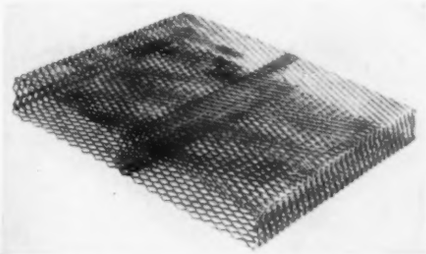


STEEL SKID PLATFORM—*Market Forge Co., Everett, Mass.* Steel deck panels of medium-gage high-tensile steel form the surface of the platforms, which can be stacked on end when empty. Stake sockets can be included.

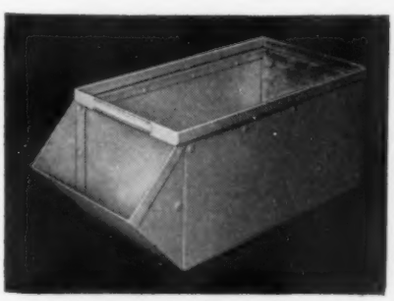


PLYWOOD PALLETS—*Clark Tructractor Div. Clark Equipment Co., 258 W. Champion St., Battle Creek, Mich.* Unit has ⅝-in. plywood decks and posts of plywood block or metal. It is double faced, designed for 4-way fork entry. Sizes from 30x40 to 48x60 in. Capacities are 4,000 lb. carrying load, 16,000 lb. static.

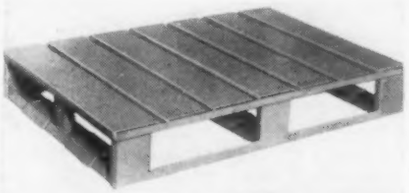
MULTI-STAK—*Pallet Div., Industrial Washing Machine Corp., New Brunswick, N. J.* Unit permits stacking of loaded pallets one upon another. Each unit holds 4000-lb. dead weight, has four securely anchored supports (made to specified measure) upon which succeeding pallets are piled and held. Supports are collapsible.



PALLET—*Phillips Mine & Mill Supply Co., 95 Jane St., Pittsburgh 3, Pa.* Expanded-metal pallet constructed of 13-gage material with ½-in. openings takes loads to 3000 lb. and has sufficient surface friction to prevent slipping.

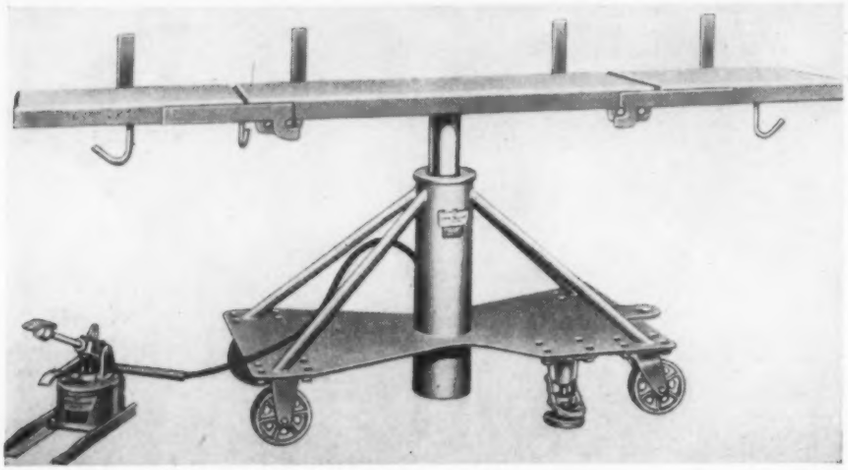


BINS—*Stackbin Corp., Pawtucket, R. I.* Hopper-fronted lightweight stackbins are made of heavy-gage aluminum designed for storage, transportation and assembly of tools, parts and materials. Bins are stored in stackracks.



FOUR-WAY PALLET—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Single-faced, and constructed of welded, corrugated, rolled steel it is used with power lift and hand trucks.

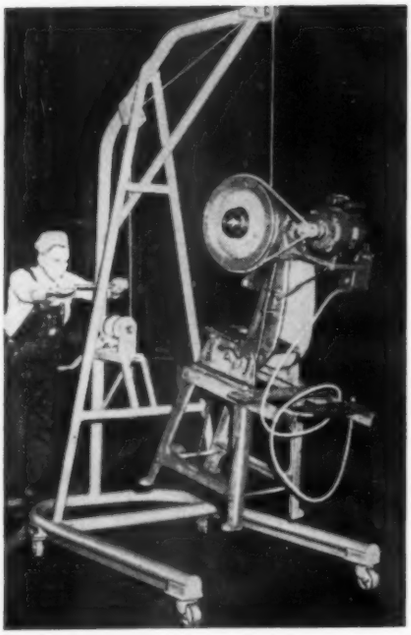
CASTERS—*Market Forge Co., Everett 49, Mass.* Aluminum-wheeled casters in swivel and rigid types are equipped with 4x2-, 6x2-, and 8x2-in. wheels. Wheels are made of aluminum alloy to reduce wear on floors.



ELEVATING TABLE — *Lyon-Raymond Corp., 3369 Madison St., Greene, N. Y.* Portable hydraulic unit is loaded with strips or sheets by overhead hoists or fork trucks.

TRACTOR—*Detroit Hoist & Machine Co., 8226 Morrow St., Detroit, Mich.* Trojan electric-motor-traveled, monorail tractor effects a "biting action" permitting a relatively lightweight tractor to move comparatively heavy loads up inclined monorails.

MAGNET CHAIN—*S. G. Taylor Chain Co., Hamond, Ind.* Triple magnet chain has 60° twist in two of three connecting links, which keep links of the legs perpendicular and reduces wear caused from gouging and kinking.



UNIVERSAL HOIST—*Almco Inc., 231 East Clark St., Albert Lea, Minn.* A U-shaped mobile hoist for transporting and lifting is of 1-ton capacity. It can be furnished with hand-operated worm-drive winch, an electric hoist or a chain hoist. Two models are 9 and 7 ft. high.

CASTERS—*The Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* The "Scout" formed caster for light- and medium-duty service has hard- or soft-tread molded-rubber 3½-in. wheels. Capacity is 125 to 250 lb. Over-all height is 4 11/16 in.

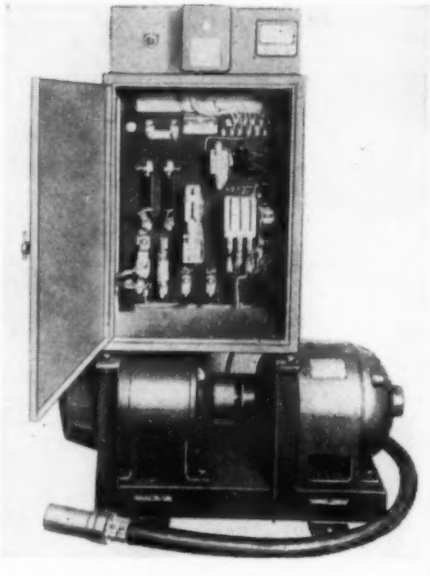
CASTER—*Aerol Co., 1823 E. Washington Blvd., Los Angeles, Cal.* An aluminum-alloy rubber-tired caster in rigid and swivel types has extra offset for instant trailing. The alloy cuts weight without sacrificing strength. The caster is available in a complete range of sizes.

SWING STAGE—*Safway Steel Products, Inc., Milwaukee, Wis.* The Saf-T-Swing light-duty swing stage consists of two gear-operated winches, with positive locking brake, each equipped with 150 ft. of cable. A stirrup which will take a platform to 28-in. width is bolted to each winch.

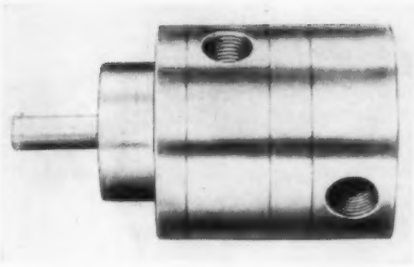
HOIST—*Wright Hoist Div., American Chain and Cable Co., Inc., York, Pa.* Line of Speedway electric hoists built in capacities of 250 to 2000 lb. incorporates grooved drum which is said to accommodate a full 12-ft. lift with no overwinding. Unit is furnished with lug, hook or trolley suspension.

HOIST—*Whiting Corp., Harvey, Ill.* A line of ¼-, ½- and 1-ton capacity roller-chain electric hoists utilizes totally enclosed, double-reduction, worm-gear drive. Control is by one-hand operation of grip.

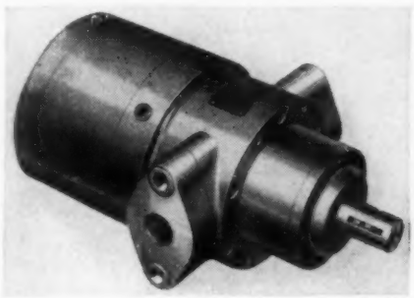
CHAIN HOIST — *Chisholm-Moore Hoist Corp., Tonawanda, N. Y.* Cyclone Model M available in four standard capacities: ¼, ½, 1 and 2 ton. Units are 96% mechanically efficient. Steel and aluminum alloys incorporated to reduce weight.



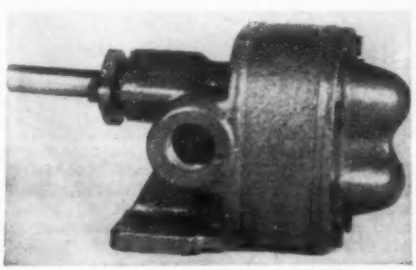
BATTERY CHARGER—*Motor Div., General Electric Co., Schenectady, N. Y.* Single-circuit battery-charging motor-generator set has control panel mounted above. Meets requirements of 18-cell, 550-amp. hr., lead-acid type storage battery.



ROTARY PUMP—*Pump Div., Ellipse Corp., 24 S. Clinton St., Chicago 6, Ill.* Series S-125 rotary pump ejects by means of vanes and rotor, and not by centrifugal force alone. At 140 F, using 150-viscosity oil, it has 2.5 gpm. capacity, 1000-psi. pressure and 26-in. vacuum. It is non-pulsating, and runs in either direction.



PUMPS — *The Denison Engineering Co., Columbus 16, Ohio.* The 3500 Series Hydroilic pumps are axial-piston, constant-displacement type. The three pumps in the series are rated at 3500 psi for continuous-duty operation. Higher pressure can be used for intermittent operation. They deliver 6, 17 and 32 gpm. respectively at 1200 rpm.



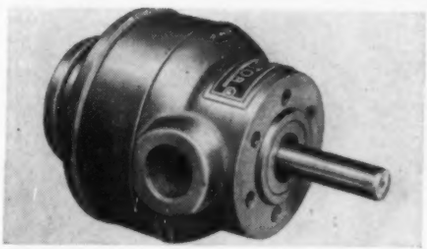
ROTARY PUMPS — *Worthington Pump and Machinery Corp., Harrison, N. J.* Available in six sizes, the G. A. rotary-type pumps come in various mountings up to capacities of 51 gpm. at 100 psi. The models are suitable for direct coupling to electric motors.

PUMPING UNIT—*John Dusenbery Co., 150 Pine St., Montclair, N. J.* Hydraulic pumping unit is especially designed for actuating rams on automotive and tractor equipment, but has applications on machine tools. Ram force of 2500 lb. is exerted at rate of 1 in. per sec. with maximum output of 46 cu.in. of hydraulic fluid.

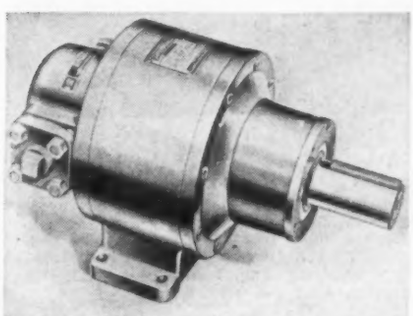
HYDRAULIC PUMP—*Aldrich Pump Co., Allentown, Pa.* The Aldrich-Lytle Hydro-pneumatic power unit is designed to provide low-volume, high-pressure service for hydraulic presses in small molding press plants and for other applications. Pump stalls when the desired hydraulic pressure developed corresponds to the air pressure used. It holds a desired hydraulic pressure without motion.

PUMP—*Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.* Centrifugal pump handles acids, salts, and other corrosive elements. Capacities of first models range to 240 gpm.; heads, to 170 ft. Sizes are 1½x1¼, 2x1½ and 2½x2 in. The pumps are single-stage, single-section, closed-impeller models.

FLAT-BELT PUMPS — *Blackmer Pump Co., Grand Rapids, Mich.* Improvements in flat-belt drive rotary pumps include a combination bracket and belt shifter of one-piece construction. Pump capacities range from 10 to 750 gpm. with pressures to 100 psi.



PUMP—*Gerotor May Corp., Baltimore 3, Md.* QH series pump designed for intermittent operating pressures to 1500 psi, or continuous pressures to 1200 psi. It has capacities of 3, 5, 8 and 12 gpm. It can be plain, base or flange mounted, and is in a stronger body than in prior models.



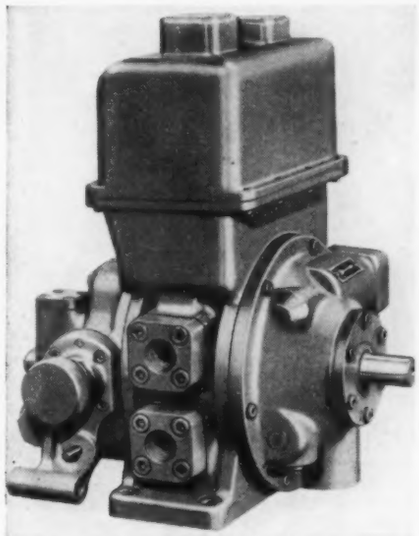
PUMP—*Superdraulic Corp., Miller at Ford Rd., Dearborn, Mich.* Hydraulic pump has 6-in. dia., is 11 in. long and weighs 35 lbs. It develops 5000 psi., and has a capacity for 3 gpm. at 1800 rpm., and 2 gpm. at 1200 rpm. It has a single bank of plungers.

GEAR PUMPS—*Bijur Lubricating Corp., Long Island City 1, N. Y.* Small-capacity constant-feed gear pump provides 50 cc. per min. at 100 rpm. Diameter of base is 2½ in. Three types are available: universal, reversible, and sump type.

PUMP—*Lyon-Raymond Corp., 3806 Madison St., Greene, N. Y.* Lightweight hydraulic foot pump has pedal-return spring, which is built inside pump body. Weight of pump is 13¼ lb., pressures to 1500 psi. are obtainable. Usable oil capacity is 15 cu.in.

HAND PUMP—*Electrol, Inc., Kingston, N. Y.* A double-action hydraulic hand pump weighs 8 lb., has 1¼-in. bore, 1¼-in. stroke. Volume is 1.5 cu.in. per cycle. Operating pressure range is from 0 to 1500 psi.

PUMP—*Miller Hydraulic Engineering and Sales, 3615 Hart, Detroit 14, Mich.* Four-piston hydraulic pump will operate in either direction of rotation. At 1200 rpm., discharge pressure ranges fom 0 to 3000 psi. and delivery is from 5.4 to 3.0 gpm.



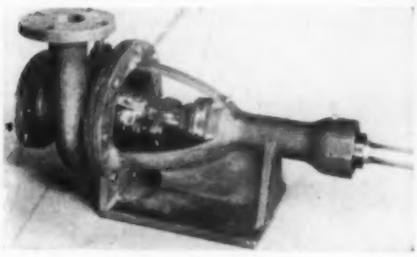
FEED PUMP—*The Oilgear Co., 1301-1427 W. Bruce St., Milwaukee 4, Wis.* Type JK feed pump is self-contained and can be mounted integral with machine or on a separate reservoir base. Three models have driveshaft speeds of 860, 1140, and 1750 rpm. Maximum feed delivery is 110, 150 and 240 cu.in. per min.

PUMP—*The Ruthman Machinery Co., Cincinnati 2, Ohio.* Pump, Model 11029, has motor totally enclosed and is equipped with an upper-end bell that has a built-in conduit box with capacity to accommodate the multiple lead wires of dual-voltage stators. Capacity at 26-ft. head: 40 gpm. with ½-hp. motor; 60 gpm. with ¾-hp. motor.

CIRCULATING PUMP—*The Ruthman Machinery Co., Cincinnati, Ohio.* The Model 1-B Rumaco circulating pump built on centrifugal principles, is provided with opposed inlet and outlet for standard (125-lb.) 2-in pipe flanges.

PUMPS—*Eco Engineering Co., 12 New York Ave., Newark 1, N. J.* Line of gearless pumps featuring a double-impeller design is said to give a strong flow against pressure. Pumps are available in ¼- and ½-in. sizes, with capacities from 1 to 12 gpm.

HYDRAULIC UNITS — *Gerotor May Corp., Maryland Ave. & Oliver St., Baltimore, 3, Md.* Hydraulic pump units embody various sizes of Gerotor hydraulic pumps and are designed to deliver steady oil flow at pressures up to 1000 psi. Single-pump units (Series 9100) have six tank capacities from 4½ to 100 gal. and operate at 1200 or 1800 rpm. Double-pump units for two separate circuits (Series 9200) have five capacities from 10 to 100 gal. and operate at 1200 rpm.

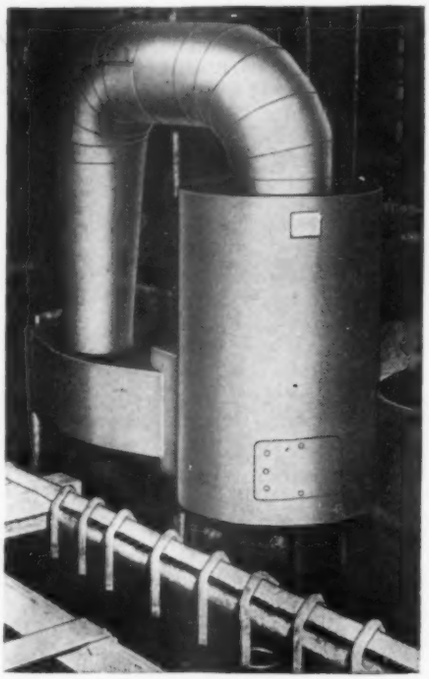


PUMPS—*Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.* Centrifugal pumps made from aluminum bronze are suitable for handling acids, salt, and alkalies where corrosive elements are involved. Single-stage, single-section, closed-impeller models, they are available in close coupled and pedestal types.

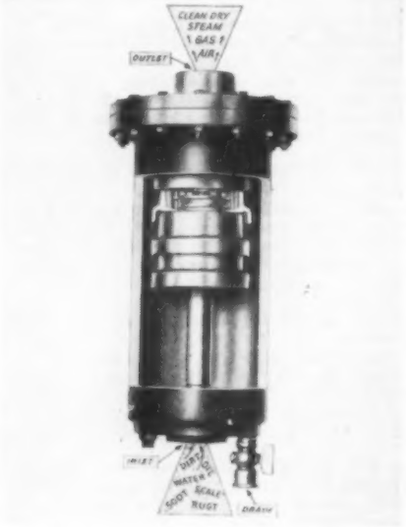
PEDRIFUGAL PUMPS — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* A line of Pedrifugal bronze-fitted cast-iron, pedestal-type centrifugal pumps comes in three sizes: 1x1, 2x2 and 3x3 in. Capacities are from 10 to 500 gpm at heads from 10 to 100 ft. with power requirements from ¼ to 15 hp. They will operate in any position.

AIR COMPRESSORS—*Sullivan Div., Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.* The "Unitair" line of two-stage air-cooled stationary air compressors are available in nine sizes with power requirements from 15 to 100 hp. Piston displacements are from 81 to 590 cfm. at 100-psi. discharge pressure based on 60-cycle motor speeds.

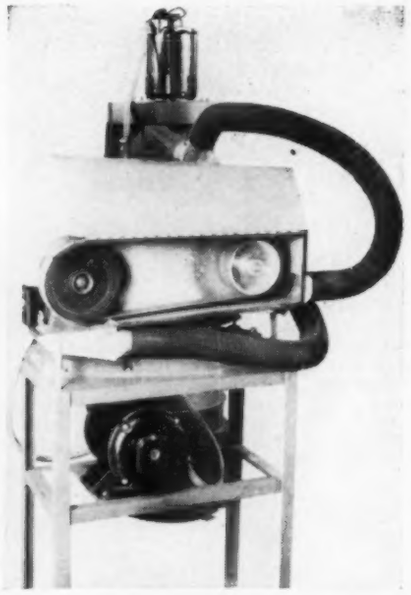
AIR-CONDITIONING UNIT — *Beach Precision Parts Co., 120 Mechanic St., Boonton, N. J.* Air-conditioning unit for compressed-air systems, known as Sta-Dri, screens out scale, rust and dirt from compressed-air pipe lines, and extracts moisture and oil fumes. Model A1 handles approximately 30 cfm. at 100 psi. Model A-2 handles approximately 65 cfm. at 100 psi.



SEPARATOR—*Industrial Electroplating Co., Inc., 219 West Vermont St., Indianapolis, Ind.* Electroplating fume separator cleans contaminated air by water absorption and centrifugal separation without the loss of room heat. Two models are available with capacities of 1,500 and 3,000 cfm.

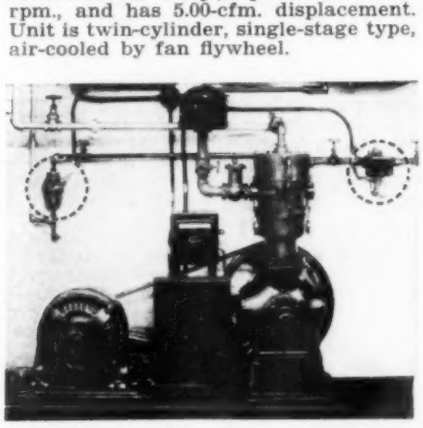


AIR SEPARATOR—*Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.* Model E is designed to deliver clean, dry steam, gas or air. Has no moving parts, screens or filters. Capacity is 250 cfm., and dimensions are 8-in. dia. x 15 in. high with 1½-in. standard pipe connection.



DUST CONTROL—*Torit Mfg. Co., St. Paul 2, Minn.* Control for Jones Model 135 bench grinder and backstand idler is provided by a Torit-built hood surrounding abrasive belt and connected by 3-in. hoses to 13-FB dust separator.

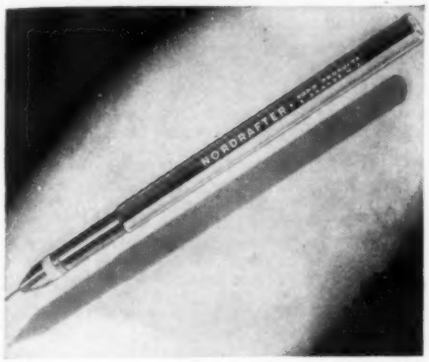
AIR COMPRESSOR—*Bristol Machine Tool Co., 913 Wood St., Bristol, Pa.* Model 100 is 1 hp., operates at 1200 rpm., and has 5.00-cfm. displacement. Unit is twin-cylinder, single-stage type, air-cooled by fan flywheel.



VALVE—*Johnson Corp., Three Rivers, Mich.* Direct-operated solenoid valve is added to compressor control. It provides automatic control of water supply to water-cooled compressors and handles temperatures to 400 F. Electrode holder is shown mounted in discharge at left, solenoid valve at right.

TEMPLETS — *John Hill Layouts, Mount Clemens, Mich.* Plexiglas Magne-Plastic machinery templets are used with a thin, transparent-plastic layout mat, ink-scribed in squares on which an outline of building or plant area can be drawn. Scaled drawings of equipment are reproduced as negatives on a photographic emulsion on bottom side of the Plexiglas templets. A print of the final layout is made by placing templets and transparent scribed paper on top of special printing paper. The setup is then exposed to quad-lamps.

BENCH PLATE—*The Herman Stone Co., 824 Harries Bldg., Dayton 2, Ohio.* A solid, all-granite bench plate, 12x18-in. is said to be accurate to 0.00005 in.



DRAFTING PENCIL—*Nord Products, East Orange, N. J.* A drafting pencil, consisting of an aluminum body with a four-jaw collet attached, measures 6 in. long and has a hardened, knurled-steel grip. There are no moving parts.

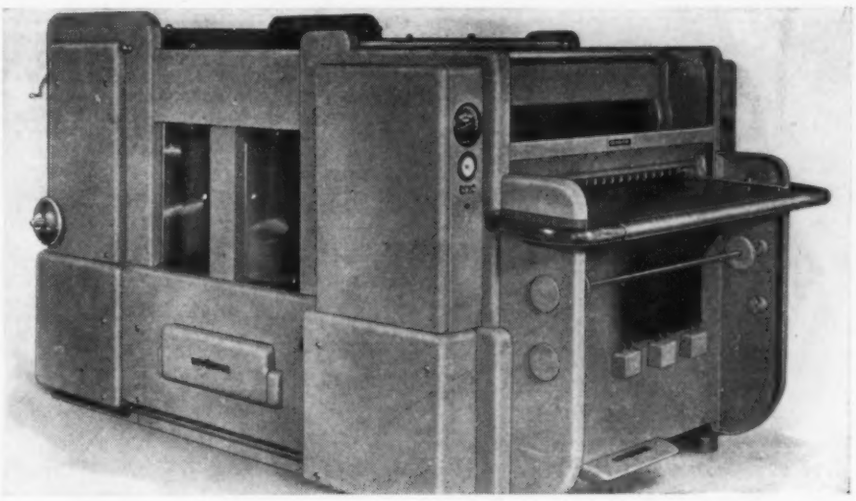
DRAWING INSTRUMENT—*Pomeroy Stereograph Co., Inc., 1783 E. 11th St., Cleveland 14, Ohio.* Perspective drawing instrument can make either single perspective or stereoscopic pairs.

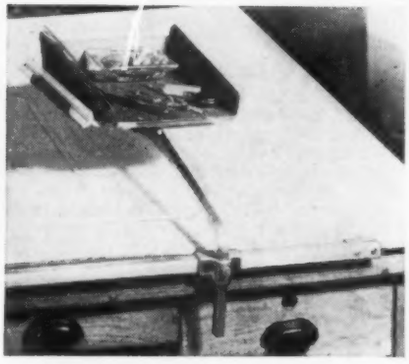
DRAFTING INSTRUMENT—*Instrumaster Industries, Inc., Arch St., Greenwich, Conn.* A line of drafting instruments includes five stencils for Axonometric drawing, an isometric protractor for plotting and measuring angles directly, and floating triangles. Triangles have integral buttons projecting on both sides so the triangle is kept 0.020 in. from the surface.

KODATRACE—*Industrial Sales Div., Eastman Kodak Co., Rochester 4, N. Y.* A translucent tracing material, Kodatrace, is made of blue-tinted safety-base film with a matte surface suitable for pencil or ink. It may be used for overlays or as originals for photographic printing. Another development is Transfax, a white, light-sensitive, quick-drying preparation which can be used to put lettering, designs and legends directly on non-absorbent surfaces.

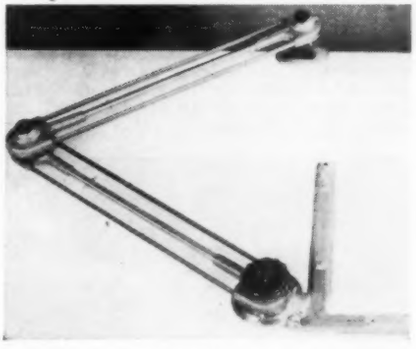
PRODUCTIVITY SLIDE RULE — *Productirule Co., Irvington, N. Y.* A productivity and wage incentive slide rule calculates among others, standard hours of work produced, productivity percentage, wage incentive earnings, daywork and base-rate earnings. The device is 10-in. long.

DRAFTING RULE—*Stewart-Jackson Instrument Co., 215 W. 7th St., Los Angeles 14, Calif.* The Vant Rule, a transparent plastic drafting scale has eight scales: 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, and 3 in. per ft. Length is 13 1/2 in., with scales reading to 12 in.





DRAFTING TRAY—*A. Wayne Nunemaker & Associates, 103 S. Wells St., Chicago 6, Ill.* Unit moves readily to desired position above working surface. Height and angle are adjustable. Tray is mounted on bars, holds working tools and accessories.



DRAFTING MACHINE—*V. & E. Mfg. Co., 758 Fair Oaks Ave., Pasadena, Calif.* Improved Vemco unit has steel covers to protect bands. Plastic brake plates are replaced by metal plates and new color system is employed.

SCALE MODELS—*Triometric Engineering Co., 1120 Wolfendale St., Pittsburgh 12, Pa.* Precision-cast models for plant layout are scaled 1/4 in. to the foot. Two dimensional templets are available which show clearance required under extreme operating and service conditions of the machine and other pertinent data.

PHOTO PRINTER—*Foster Sales Co., Royal Oak, Mich.* Photo printer for blue or black line prints in sizes to 24x18 in. operates with photoflood bulbs and has a closed compartment in the base to hold paper.

BLUEPRINTING MACHINE — *Paragon-Revolute Corp., Dept. AM, 77 South Ave., Rochester 4, N. Y.* M4 Automatic produces blueprints, whiteprints, vandyke prints and blueline prints. Infinite speed range from 6 to 32 fpm. Unit incorporates revolving contact principle.

PRINTER-DEVELOPER — *Ozalid, Div. General Aniline and Film Corp., Johnson, N. Y.* The Ozalid Streamliner, a positive-printing, dry-developing machine, reproduces anything drawn, typed, printed or photographed on translucent material. It delivers 42-in. wide black, blue, red, sepia or yellow reproductions in 25 sec.

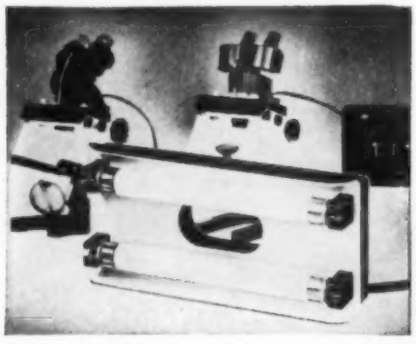
PRINTER-DEVELOPER — *Charles Bruning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.* The Model 91 BW Volumatic Printer-Developer takes roll stock up to 42 in. wide at speeds up to 30 fpm. The Volumatic prints all Bruning BW mediums. Control is provided by "on-and-off" pushbutton controls over motors and heaters, a speed-control knob and a calibrated speed dial.

PLANT SERVICE EQUIPMENT — Miscellaneous

CALCULATOR — *Lightning Calculator Co., Inc., 496 Atlantic Ave., Brooklyn 17, N. Y.* Pocket-size calculator for sequential sampling can be calibrated to fit existing standards, or a sequential sampling program can be developed by consultation with a quality-control statistician.

FIRE DETECTOR—*C-O-Two Equipment Co., P. O. Box 390, Newark 1, N. J.* An industrial smoke detector, designed to detect fire in industrial plants, operates on the principle of light reflected by smoke particles to a photoelectric cell. Air samples are drawn into detecting chamber, and, at first sign of smoke, a red indicating lamp lights and an alarm sounds.

SALVAGE DEVICE—*The Dilley Mfg. Co., 1691 Ansel Rd., Cleveland 6, Ohio.* The Goldigger, a device to collect and salvage precious materials at point of operation, fits over rotating machine spindles. Top section of the unit is made of "tru-vision" plexiglas. The unit comes equipped with alnico permanent magnet.



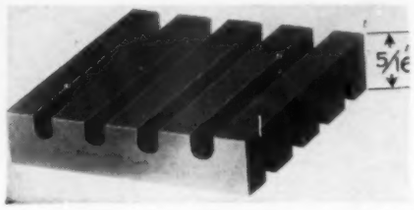
MINIATURE LIGHTS — *Stocker and Yale, 48 Birch St., Marblehead, Mass.* Miniature fluorescent lights are for use on microscopes, jeweler's lathes, or other applications. Intensity is 450 foot-candles at a 2-in. working distance on microscope model and 550 foot-candles at 3 in. on other model.

SAFETY DEVICE—*Oiltrol Co., 2550 15th St., Denver 11, Col.* Oiltrol is an oil-pressure-activated safety device installed in pressure-lubrication systems. When pressure drops below safe operating levels, the switch is activated and energizes danger signals or emergency controls of any desired type.

PLASTIC APRON—*West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.* The Durma-Gard apron offers protection against acids, alkalis, grease, oils and other agents. Made of plastic, it has heat-sealed seams and reinforced stress points.

CLAMP AND DRUM CUTTER—*Merrill Brothers, 5604 Arnold Ave., Maspeth, L. I., N. Y.* The O'Brien-Volz Combination, uses a drum cutter and a clamp to convert steel barrels to tote boxes or containers. The cutter removes the top of any steel barrel. Then the clamp is used to provide a means for lifting.

INDUSTRIAL LAMPS—*General Electric Lamp Department, Nela Park, Cleveland, Ohio.* Two 125-w. infrared industrial lamps have medium skirted bases and are rated in excess of 5000 hr. One lamp has a G-30 bulb and the other has an R-40 reflector-type bulb.



MOUNTING PADS—*The MB Mfg. Co., Inc., New Haven 11, Conn.* Isomode pads are used under machinery. Made of neoprene in standard 18x18x5/16-in. size, pads compensate for variation in floor surface and eliminate need for hold-down bolts, skids, concrete mats or grouting.

MOUNTING—*Lord Mfg. Co., Erie, Pa.* The Multiplane mounting, which is claimed to secure equal softness in all planes and to isolate vibration from all directions, is recommended for equipment exposed to vibration of indeterminate nature.

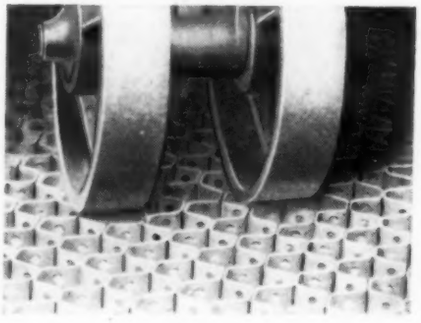
TIME-STUDY BOARD—*A. J. McDonald, 2248 N. Avers Ave., Chicago 47, Ill.* Time-study board and stop-watch holder with a total weight of 8 oz. Board is made of lucite.

SAFETY GOGGLE—*American Optical Co., Southbridge, Mass.* A lightweight all-plastic safety goggle has air-conditioned eyecups to reduce fogging of lenses. Known as A-O Panoram, goggle protects eyes on jobs such as chipping, grinding, riveting.

GOGGLE — *Mine Safety Appliances Co., Pittsburgh 8, Pa.* The Speedframe, a self-adjusting welders' goggle is raised or lowered by nod of the head, leaving operator's hands free for work.

HANDGUARD—*Industrial Gloves, Co., Danville, Ill.* The Steel-Grip Handguard No. 15407 leaves thumb and finger-tips free for picking up material. It is made of split cowhide and is steel stitched. An elastic web band runs across the back of the hand.

GOGGLE—*Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.* Speed-Shift goggle mounted on a flexible, form-fitting, plastic headgear permits the wearer to move it in and out of position with the one hand.

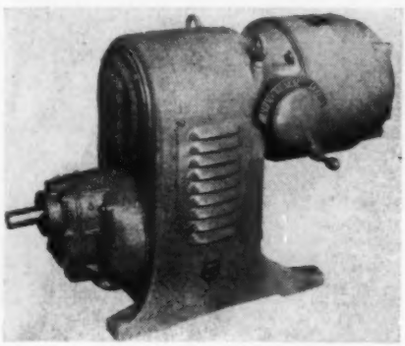


STEEL FLOORING—*Klemp Co., 6601 S. Melvina Ave., Chicago 38, Ill.* Two steel surface armors are for permanent protective flooring. Floor steel is a flexible cold-rolled strip steel in standard rolls 47½ in. or 60 in. wide × 25 ft. long. Heavy-duty Hexteel floor armor is a hexagonal-shaped steel grid.

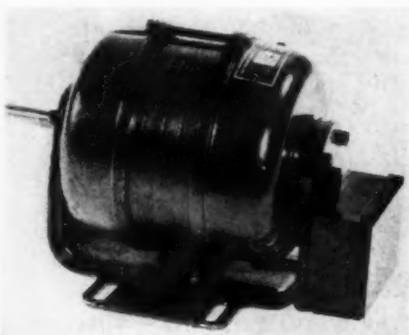
CLEANER — *Holub Industries, Inc., Sycamore, Ill.* The No. 77 blower and cleaner unit has a 1-hp. sealed ball-bearing motor and a two-speed switch.

AMERICAN MACHINIST 35th ANNUAL REVIEW

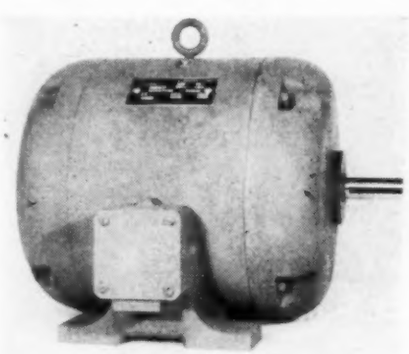
Parts and Materials



VARIDRIVE MOTOR—*U. S. Electrical Motors, Inc., Milford, Conn., or 200 E. Slauson Ave., Los Angeles 54, Calif.* First of a new series of Varidrive motors, the Size 23 has a variety of assemblies available. Speed variations of 2:1 to 7:1 are available with output up to 5 hp.



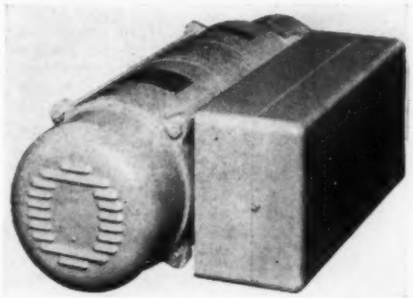
MOTOR—*The Southern Cross Mfg. Corp., 1028 Connecticut Ave., Washington 6, D. C.* ¼-hp. single-phase motor features: continuous duty, reversible rotation, and resilient mount. Speed is 1725 rpm., shaft dia. is ½ in., and over-all length is 10½ in.



THREE-PHASE MOTORS — *Kato Engrg. Co., Mankato, Minn.* Motors in 1½-, 2-, and 3-hp. sizes are totally enclosed. Readings of 1½-hp., 1160-rpm. motor average as follows: 2.6 amp.; 440 v., 67% power factor, 6.9 ft. lb., 60 cycle.

MOTOR—*General Electric Co., Schenectady, N. Y.* Adjustable-speed Tri-Clad induction motor is available in ratings from 3 to 50 hp., and has infinitely adjustable speed over a 3 to 1 ratio by turning a dial.

INDUCTION MOTOR — *Apparatus Dept., General Electric Co., Schenectady, N. Y.* Hollow-shaft Tri-Clad vertical motor for pump drives is available in ratings from 1 to 500 hp., all speeds and frequencies. A cooling system draws in air at both ends and discharges it through holes in the stator frame.



AMPLIDYNE—*General Electric Co., Schenectady 5, N. Y.* Electronic amplidyne consisting of high-gain balanced dc. electronic amplifier and motor. Amplidyne is useful for precise regulation of current, voltage, and speed. Equipment has an output of 1½ kw., 250 v. Speed range of 20:1 or greater is available.

MOTORS—*Reliance Electric & Engineering Co., Cleveland, Ohio.* Precision-eered line of squirrel-cage ac. motors for machine-tool drives range from 1 to 200 hp. in open and closed types.

MOTORS—*Century Electric Co., 1806 Pine St., St. Louis 3, Mo.* Fractional and integral horsepower motors are in the D-Flange design. Single-phase motors include repulsion-start induction-run brush-lifting motors. Polyphase motors include squirrel-cage induction motors.

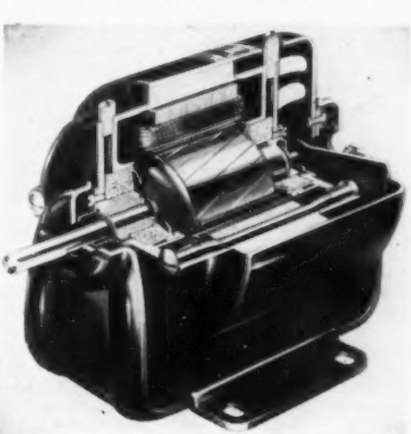
MOTORS—*Westinghouse Electric Corporation, Pittsburgh 30, Pa.* Horizontal-type gear motors are now available with the Life-Line motor. The new units are available in single reduction, accommodating a maximum gear ratio of 6.25 to 1, and in two double-reduction types for maximum gear ratios of 25.7 to 1 and 58.3 to 1.

INDUCTION MOTORS—*Electric Machinery Mfg. Co., Minneapolis 13, Minn.* Heavy-duty squirrel-cage induction motors for drives from 100 to 1000 hp. with 1800 rpm. speed or less. The units are designed to be drip- and splash-proof.

MOTOR—*Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.* Starting torque of 1-hp. ac. motor has three times full-load torque to overcome dead load.

MOTORS—*Fairbanks, Morse & Co., Freeport, Ill.* In the "Axial Air-Gap" ac. electric motors magnetic lines of force follow a path parallel to the axis of rotation as compared to the radial path taken by magnetic flux in conventional motors. Length of the motor is approximately one-half that of a conventional motor of same rating. Weight reduction is about 30%. The motors are available from ½ to 10 hp. in 2- and 3-phase types, and in ½ to 3 hp. in capacitor-type single-phase units.

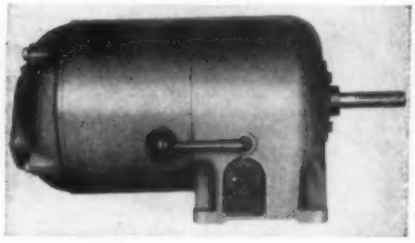
MOTORS — *Westinghouse Electric Corp., Pittsburgh 30, Pa.* Silicone resins for winding insulation and silicone grease for bearing lubrication make possible a totally inclosed non-ventilated motor in the 3- and 5-hp., 4-pole rating in the same frame sizes as the open motor of the same rating.



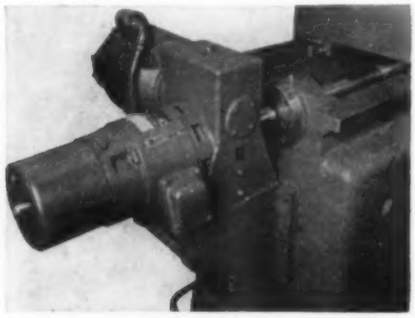
MICROMOTER—*Redmond Co., Inc., Owosso, Mich.* The improved Type "T" ac. Micromoter, made in sizes from 1/25th to 1/100th hp., has a four-pole shaded pole motor and a three-piece die-cast frame with air-stream cooling system.

GENERAL-PURPOSE MOTOR—*L & R Mfg. Co., 577 Elm St., Arlington, N. J.* A general-purpose universal motor is supplied with a three-step pulley, foot rheostat and reversing switch. The motor is rated 1/10 hp. at 5000 rpm., ac. or dc. and has a 3¼-in. O.D

MOTOR—*Guernet Electrical Machinery, Inc., Box 196, Meriden, Conn.* Model T variable-speed motor maintains constant maximum torque at all speeds. Variable from 1500 to 6000 rpm.



GEARSHIFT DRIVE — *The Lima Electric Motor Co., 1501 Findlay Rd., Lima, Ohio.* Four-speed, Type R, Lima gearshift drive has an integrally mounted single-phase motor. Made in sizes of ½ hp. (at 1200 rpm.) and ¾ hp. (at 1800 rpm.) Gear ratios are 1:1, 1:33:1, 2:1, and 4:1.

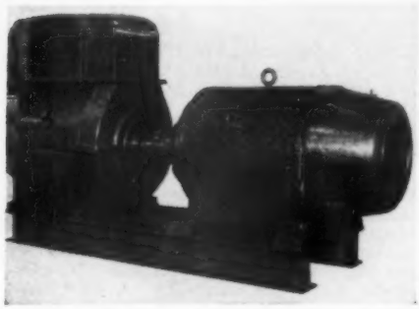


FEED-TRAVERSE DRIVE—*General Electric Co., Schenectady, N. Y.* A feed-traverse drive for machine tools, is composed of an ac. traverse motor and a dc. feed motor in one unit.

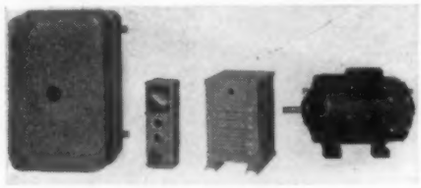
STARTERS, SWITCHES—*Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn.* Right-angle magnetic starters for magnetic-switch operation is intended to minimize space and to provide gravity drop-out and balanced mechanism.

PHASE CONVERTER—*Reid Brothers Co., Inc., Beverly, Mass.* A phase converter changes 110-v., single-phase current to 220-v., 3-phase current and drives any machine or machines up to 1½-hp. capacity.

GENERATORS—*Electric Machinery Mfg. Co., Minneapolis 13, Minn.* Generator sets for powering high-frequency portable tools, have voltage-regulating circuit to instantly restore voltage to normal whenever there is a change in load. Sets are rated 31.3 and 63 kva., 240 or 480 v. at 180 or 360 cycles.



GENERATOR—*General Electric Co., Schenectady, N. Y.* Totally-enclosed, unit-cooled generators are used in motor-generator sets or in other generating applications in non-hazardous atmospheres where ratings make totally-enclosed fan-cooled construction impractical. Available in rating of 30 to 150 kw.



VARIABLE-SPEED DRIVE — *Industrial Electronics Div., Raytheon Mfg. Co., Waltham, Mass.* The Servotron electronic variable-speed drive is a ¾- to 1-hp. drive, and consists of four units: (starting from left) a control unit, a control station, a transformer, and dc. motor.

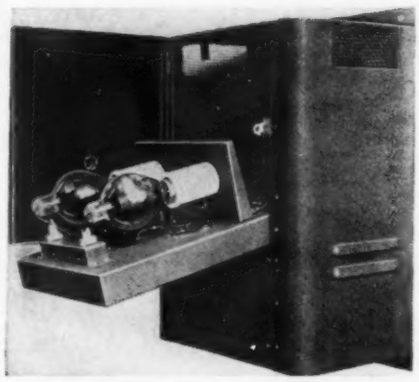
CONTROLLERS — *Furnas Electric Co., 438 McKee St., Batavia, Ill.* "A" series 1-hp. electric-motor controllers have four switching arrangements: reversing two-speed, series-parallel and three-pole off-on.

MOTOR CONTROL — *Weltronic Co., 19500 W. Eight Mile Road, Detroit 19, Mich.* An electronic motor control, for dc. shunt-wound motors up to ½ hp., is for applications where automatic compensation for changing load and changing line voltage is not required.

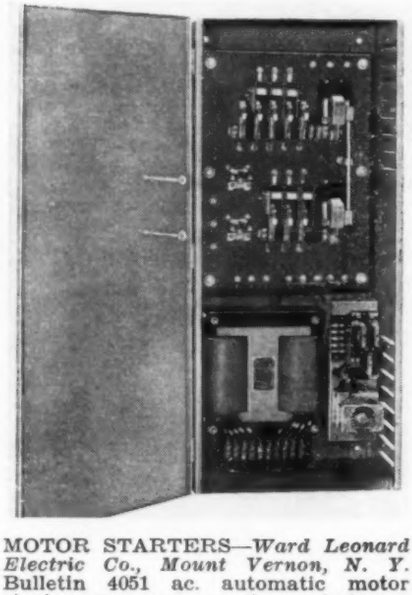
MOTOR DRIVE—*Ward Leonard Electric Co., Mount Vernon, N. Y.* "60 A" small motor drive is designed for remote and automatic operation of single and multiple rheostats. It has 13-in. dia. and is approximately 7 in. high. It can be used with 115- or 230-v. ac. or dc., has 30- or 60-sec. travel.

TIMER—*Potter Instrument Co., Inc., 136-56 Roosevelt Ave., Flushing, N. Y.* Model 450 interval timer, for applications requiring accurate time-interval measurement, will measure intervals in steps of 0.625 microsecond and will register, directly, intervals to 1 sec.

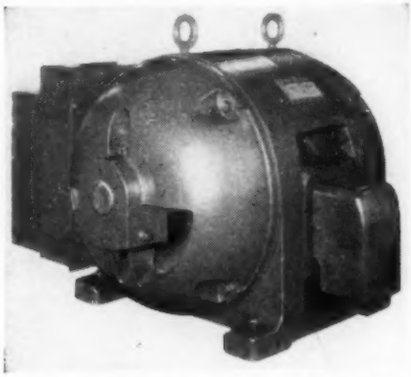
CAPACITORS—*Aerovox Corp., New Bedford, Mass.* A line of bracket-mounted, armored, motor-starting capacitors, Series SRVC, are built compactly, measuring 2 1/16-in. dia. by 2⅞ to 3¾-in. long, depending on voltage and capacitance ratings. Capacitances range from 1 to 8.5 mfd.



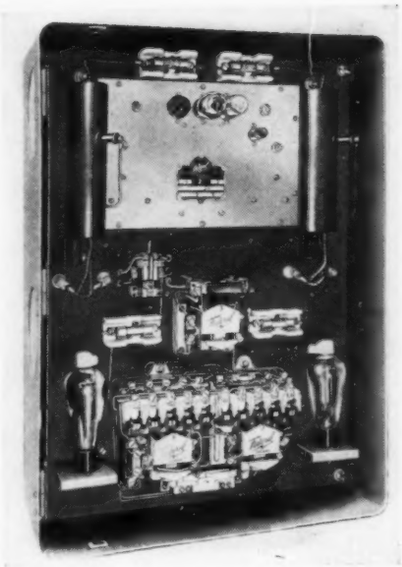
RECTIFIER—*Weltronic Co., Dept. K, 19420 W. Eight Mile Rd., Detroit 19, Mich.* Electronic rectifier for direct current requirements replaces motor-generator sets where power from 750 to 2000 watts is desired. Known as Series WR 40-50-60, voltage is 115/230 dc., 115/230/460 ac.



MOTOR STARTERS—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 4051 ac. automatic motor starters are non-reversing auto-transformer type for use where inrush starting currents must be reduced or where motor starting torque requires adjustment. Units are made in standard sizes for use with squirrel-cage induction motors to 100 hp., 550 v., 60 cycles.



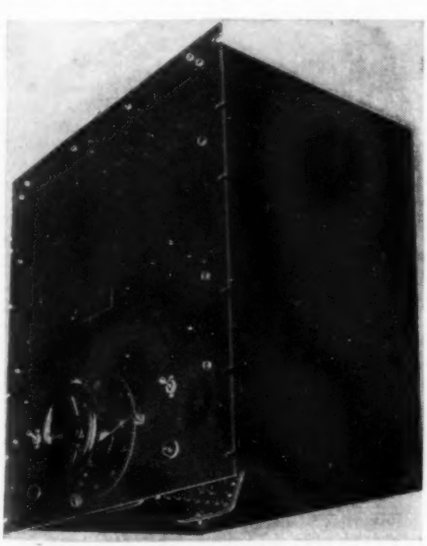
CONVERTER—*General Electric Co., Schenectady, N. Y.* Power supply for high-speed ac. motors for applications on grinders and drills called Tri-Clad Type AKC inductor frequency converter, is a self-excited, self-driven machine.



MOTOR CONTROL—*Federal Electric Products Co., Newark, N. J.* Electronic motor control, the Noark, for operating dc. motors is in two models: a general-purpose reversing type applied to a 2-hp. 220-v. dc. motor, and a special control for an Abrasive M-3 surface grinder. The control is said to provide an almost flat speed-torque curve with changes in load having little effect on speed.

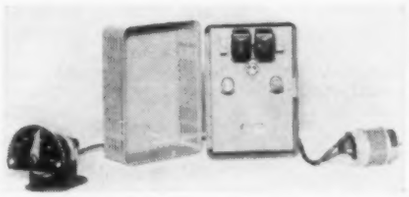
PULSING DRIVE—*Yardeny Laboratories, Inc., 105 Chambers St., New York, N. Y.* The Pulsing Drive is used for controlling electric motors when accurate positioning is important. Motors from fractional to 25 hp. or more can be connected to unit.

BRAKE—*Stearns Magnetic Mfg. Co., 635 S. 28th St., Milwaukee 4, Wis.* Magnetic disk brake for fractional horsepower motors has a maximum torque rating of 2 lb. ft. for continuous duty, 3 lb. ft. for intermittent duty.

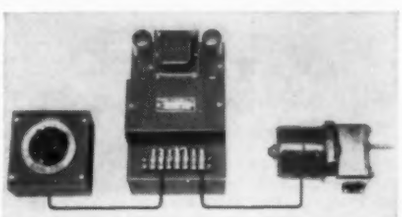


POWER SUPPLY—*Superior Electric Co., 179 Church St., Bristol, Conn.* Power supply is for continuous duty and easy adjustment of output. It is a 0 to 3000 v. model with dc. output of 0.5 amps. It operates on 115 v., single phase, 50-60 cycles. A full-wave bridge rectifier consisting of 4 type 866/866A tubes is used. The supply mounts on a standard 19-in. relay-rack panel.

PROTECTRON — *The Brinell Co., Granby, Conn.* The Protectron is an electronic device used with electric-motor-driven machines. It is set to trip at any preset mechanical load increase above normal. When it trips a relay is energized to initiate desired control function.

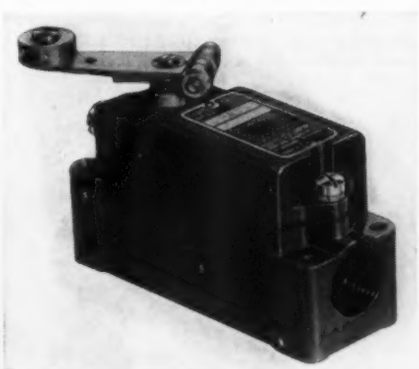


CONTROL SYSTEM—*Control Div., General Electric Co., Schenectady, N. Y.* An electronic positioning control system is designed to perform jobs such as positioning heavy work in machine tools, and opening, closing and adjusting to intermediate points valves and gates from a single control desk.



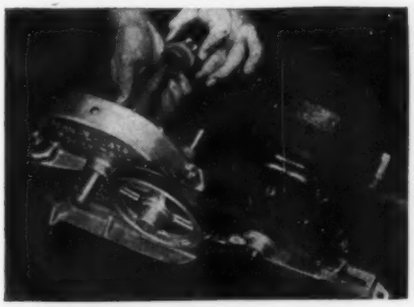
REMOTE CONTROL—*Yardeny Laboratories, Inc., 105-107 Cambers St., New York 7, N. Y.* The Synchro-Link, a remote control for fractional or integral-hp. motors, up to 35 hp., will position one or more distant motors.

PANELBOARD—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* Plug-in panelboard has thermal-magnetic multi-breakers. Due to small size of MO4 multi-breaker units, panel affords increased gutter space: 5½-in. gutters in 15-in. wide panelboard. Available in 100- and 200-amp. mains ratings.



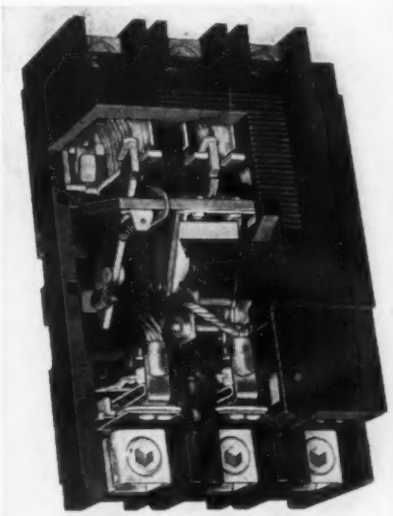
LIMIT SWITCH—*Industrial Controller Div., Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* A precision snap switch suitable for machine-tool limit-switch applications is available with roller-arm or push-rod operated mechanisms. Cover and switch assembly can be rotated 180° to reverse the ½-in. conduit entrance.

BATTERY CHARGING—*The Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.* Sectionalized control panel for battery charging is fastened to the wall by means of two angle-iron brackets. Each section comprises a complete charging circuit with totally enclosed controls on the front of the board.



POWER DRIVE — *Flinchbaugh Co., 750 S. Court St., York, Pa.* "Men-E-Uses" variable-speed power drive for fractional motors has a range from 20 to 750 rpm. when used with 1725 rpm. motors. With the addition of an auxiliary shaft, speeds down to 4 rpm. are possible.

REMOTE CONTROL UNIT—*Sperry Products, Inc., 15th St. & Willow Ave., Hoboken, N. J.* The Type HCO8 miniature hydraulic remote control has a torque capacity of 50 lb.-in. on the pressure stroke. Applications include throttle, mixture, valve and position-indicator control. Unit can provide remote control up to 35 ft.



CIRCUIT BREAKER—*Square D Co., Detroit 11, Mich.* Type ML-3 has trip ratings from 125 to 225 amp. Voltages are: 125- to 250-v. dc., 250-v. ac.; 250-v. dc. 600 v. ac. Solderless connector facilitates insertion of heavy cable by swinging open lug.

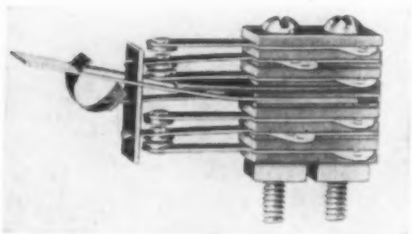
TRANSFORMERS — *Transformer Div., Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.* Air-cooled units for use with electric furnaces, for testing and applications requiring heavy current. Different sizes rated from 1 to 100 kva.; up to 600-v.; single, 3 or 3-to-2 phase.

TRANSFORMERS—*Specialty Transformer Div., General Electric Co., Schenectady 5, N. Y.* Line of machine-tool transformers includes ten ratings from 0.075 to 3 kva. for use on 60-cycle circuits. For 25-cycle applications, transformers are listed in four sizes from 0.150 to 0.500 kva. All-purpose group rated for both 50- and 60-cycle circuits is provided.

MAGNET HOLDING — *Metallurgy Div., Chemical Dept., General Electric, Pittsfield, Mass.* Line of Alnico permanent-magnet-holding assemblies consists of five types in 17 sizes ranging from a pull of 1½ to 500 lb. Line features both "Close Flux" and "Deep Flux" types of assemblies.

CIRCUIT BREAKER—*Westinghouse Electric Corp., 306 4th Ave., Box 1017, Pittsburgh 30, Pa.* Improved Quicklag circuit breaker incorporates tripping action which combines the inverse time-limit characteristics of bimetal thermal action on overloads with the operating speed of magnetic trip action on short circuits. Available in single or double pole, 10 to 50 amp., 125 to 125/250 v. ac.

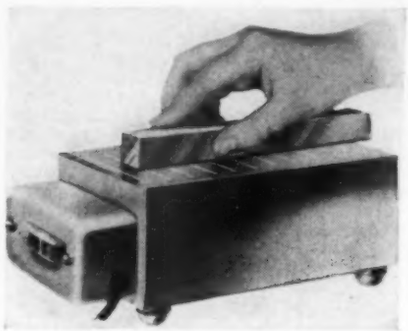
SWITCH—*Micro Switch, Freeport, Ill.* Type N2 die-cast enclosed switch with adjustable roller-arm actuator is used in industrial equipment where switch is exposed to dust, dirt, abrasives and occasional splashing of water and oil. Operating force is 6 to 16 oz. minimum release, 4 oz.



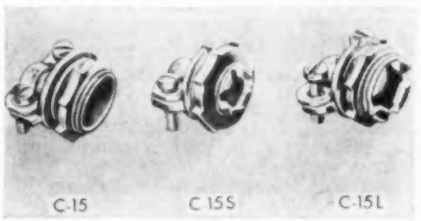
OPEN-BLADE SWITCH—*Acro Electric Co., 1321 Superior Ave., Cleveland 14, Ohio.* Compact two-pull snap switch has patented beryllium rolling spring. It is made with single- and double-throw contacts. Standard operating pressures are 3 to 5 oz. The switch is rated at 15-amp., 125-v. ac.

RECTIFIER — *LaMarche Mfg. Co., 6525 Olmsted Ave., Chicago 31, Ill.* Selenium rectifier, said to maintain constant voltage regardless of changing amounts of current drawn from it, handles gangs of low-voltage dc. magnets in varying loads from 0 to 20 amp. with no variance in voltage.

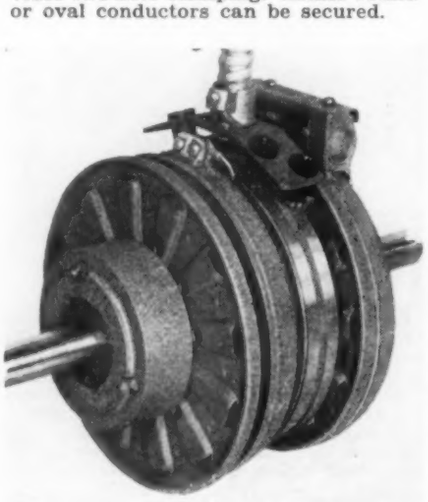
SWITCH HOUSING—*Micro Switch, Freeport, Ill.* LRM5 switch housing for limit-switch applications, has rotary actuator to provide protection, actuating means, and conduit connection for element enclosed in housing.



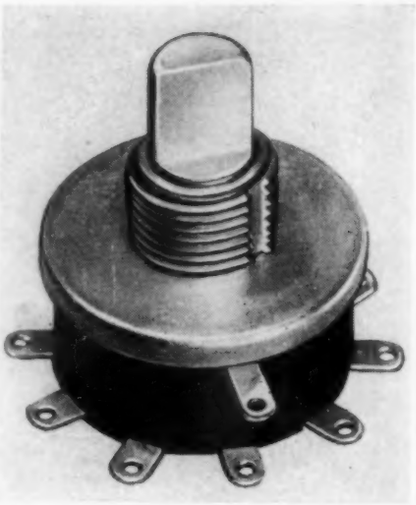
DEMAGNETIZER — *Luma Electric Co., Toledo 1, Ohio.* A grid-type ac. demagnetizer is said to demagnetize small pieces in one pass over the grid. The grid is segmented to spread the field over the grid surface. The units are furnished in three sizes: 4½x7¼ in., 7¼x7½ in., and 7½x14 in.



CLAMP CONNECTOR—*Gedney Electric Co., 1270 6th Ave., New York 20, N. Y.* A series of malleable-iron two-screw clamp connectors are for screw and uniform cable or cord grip, provides two-hole clamping. Either round or oval conductors can be secured.

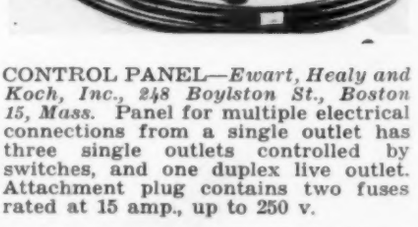


BRAKE—*Warner Electric Brake Mfg. Co., Beloit, Wis.* Industrial clutch and brake unit for machine-tool applications consists of an electro-magnet and an armature disk. Both brakes and clutches are available in four sizes—825, 1000, 1225, and 1525.



MINIATURE SWITCH—*Grayhill, 1 N. Pulaski Rd., Chicago 24, Ill.* Series 5000 Roto Switch has ¾-in. dia. and 13/32-in. depth. Contact pressure is 2½ lb. With ten positions, the switch can be rotated 360° clockwise or counterclockwise. It can be used in circuit combinations to 5 amp., breaking up to 1 amp. at 110 v.

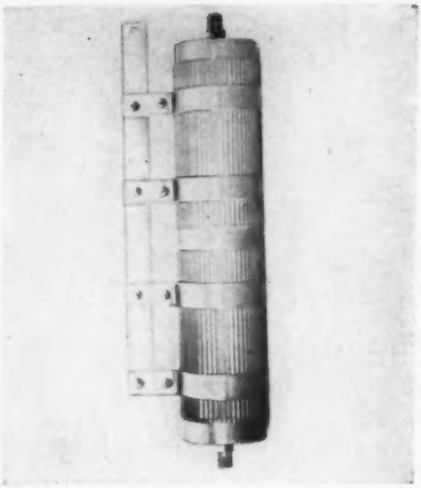
FOOTSWITCH — *Harrison Mfg. Co., 7221 Hocker Ave., Merriam, Kan.* Gilmat footswitch has silver contacts enclosed in molded bakelite. Top and base are heavy cast aluminum with non-slip rubber base. Capacity is 1250 w. Handles 10 amp. at 125 v., or 5 amp. at 250 v.



CONTROL PANEL—*Ewart, Healy and Koch, Inc., 248 Boylston St., Boston 15, Mass.* Panel for multiple electrical connections from a single outlet has three single outlets controlled by switches, and one duplex live outlet. Attachment plug contains two fuses rated at 15 amp., up to 250 v.

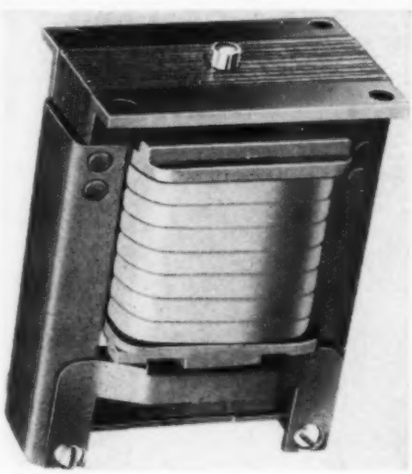
CUT-OUT SWITCH — *George Ulanet Co., 413-415 Market St., Newark 5, N. J.* Ula-Snap snap-action thermal cut-out switch will cut off a machine at a predetermined temperature and remain inoperative until reset. It operates at temperature ranges of 0-150, 0-300 and 0-700 F. Over-all size is 1x1x3½ in.

SOLENOID VALVE—*Henry Valve Co., 2360 W. Grand Ave., Chicago 51, Ill.* The SV-11 solenoid valve for small-capacity installations involving freon, methyl chloride, oil, gas and air, among others, is incorporated in a standard outlet box and is furnished with ⅜-in. FPT connections.



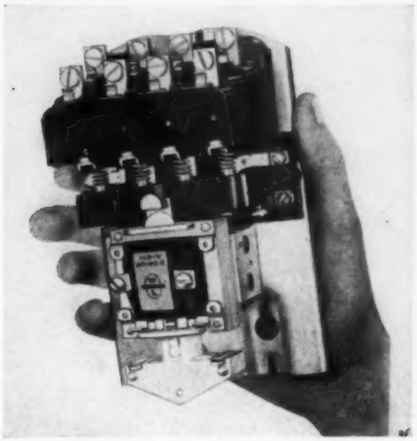
SELENIUM RECTIFIER—*Ion Industries, Inc., Riverdale, Chicago 27, Ill.* Selenium rectifiers produced by electrolytically depositing selenium use circulating-liquid cooling. Made in standard 250-amp. elements. Assemblies can be made in number needed for output required, connected in series or parallel.

HANDYMAN—*John T. O'Connor & Co., 190 South Valley Rd., West Orange, N. J.* Photoelectric control device will measure light intensity, act as a switch, and can be used as combination counter or meter. Internal arrangement provides for filters for color or infra-red operation.

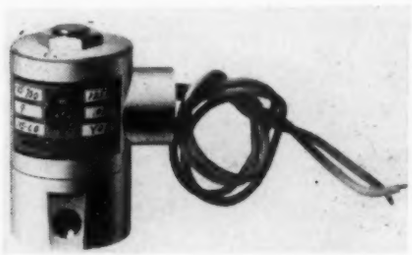


SOLENOID — *Practical Electric Co., 4505 Oakwood Blvd., Melvindale (Detroit), Mich.* A solenoid adaptable to push or pull work may be disassembled and the coil replaced by removing two screws. Voltage rating of each coil is indicated by a lead-wire color code.

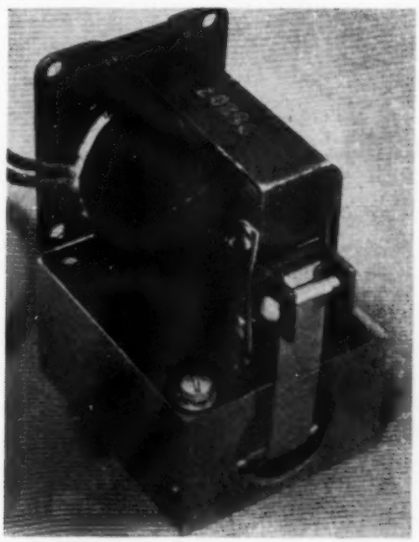
SOLENOID—*General Electric Co., Schenectady 5, N. Y.* Small all-welded solenoid, for use where powerful pull is needed in small space, such as in appliances and safety devices, develops maximum pull of 0.26 lb. in a ½-in. stroke.



SOLENOID CONTACTORS — *Ward Leonard Electric Co., Mount Vernon, N. Y.* Size 1 ac., used as mainline, reversing or accelerating contactors on ac. motor controllers for machine tools, pumps, and compressors, are available with up to four main poles, with maximum ratings of 7½ hp., 440 to 550 v. on 3 phase, 60 cycles.

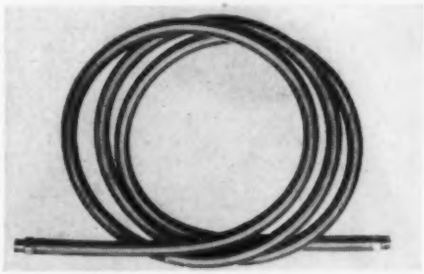


SOLENOID VALVE—*Skinner Chuck Co., New Britain, Conn.* Valve is used with ⅛- to ⅜-in. pipe. Soft synthetic inserts on stainless steel seats prevent leakage.



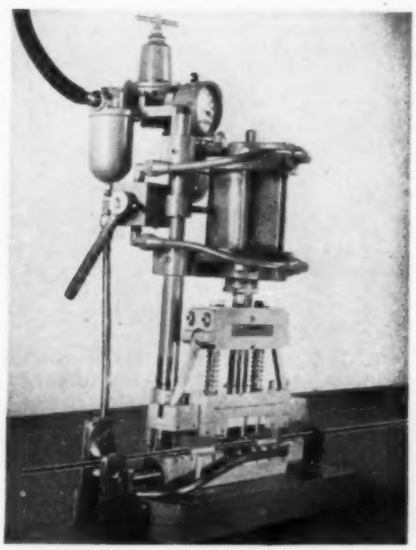
SOLENOID VALVE — *Electrol, Inc., Kingston, N. Y.* A 110-v. ac. solenoid two-way valve for machines where continuous duty is desired accommodates pressures to 1500 psi, or higher. Comes in NPT sizes of ⅛, ¼, ⅜ and ½ in.

BELT SPLICE—*Unisplice Belting Co., 1150 Wolfendale St., Pittsburgh 12, Pa.* The Unisplice belt splice provides a method by which woven cotton belting can be spliced at the workplace. It has no hooks or laces and is said to eliminate the necessity for special prewoven sizes for each installation.



FLEXIBLE CONDUCTOR—*Titeflex, Inc., 500 Frelinghuysen Ave., Newark, 5, N. J.* Conductor for transmission of high-power, high-frequency current, it is water-cooled for minimum losses. It consists of brass, water-tight convoluted inner core with an outer braid conductor. Power losses are said to be less than conventional ¼-in. copper-tube conductor.

WIRE STRIPPER—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* Hot-Blade wire stripper uses two electrically heated blades to strip cotton, silk, plastic or rubber covering up to ⅜ in. from stranded or solid conductors.



WIRE STRIPPER — *The Williams Products Co., Middletown, Conn.* Wire-stripping machine cuts, strips and slits one-, two- and three-conductor wire up to ½-in. dia. One or all operations can be performed simultaneously. It measures 18 in. wide, 11 in. deep and 25 in. high.

PULLEY—*Scientiae Corp., 103 Pine St., Dayton 3, Ohio.* The Spiralok is a fixed, adjustable, variable-pitch V-belt pulley. Spiral wedging action locks the pulley in rigid alignment with shaft, using no setscrews and requiring no threads or keyways. It will drive in either direction, and an infinite number of adjustments may be made.

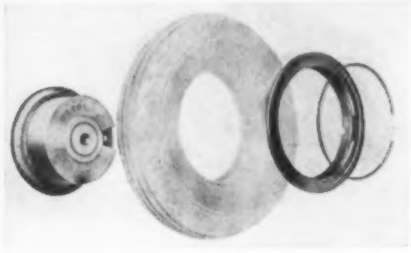
RADIAL BEARINGS—*Nice Ball Bearing Co., Hunting Park Ave., Philadelphia 40, Pa.* Series 3000 line of unground radial bearings is for medium loads and maximum speeds of 2500 to 3000 rpm. Where loads are smaller and service is intermittent, higher speeds can be used. All bearings are held to 0.005-in. tolerance (or less) on I.D. and ground to 0.0006 in. (or less) on O.D.

BEARING—*McGill Mfg. Co., Valparaiso, Ind.* Cam-Yoke roller bearings in a complete range of standard sizes CVR bearings were designed to increase the adaptability of Multirol cam-follower applications for mounting of the roller unit on a shaft. Shaft sizes begin at 0.250 and include a bore diameter of 1.25 in.

NEEDLE BEARINGS—*Orange Roller Bearing Co., Inc., 557 Main St., Orange, N. J.* Cage-type needle bearing is available in a long range of shaft sizes. Rollers run in a cage in pockets coined to roller contours. Adapted for high speed and spindle applications, vertical and overhung.

LINEAR BALL BEARINGS—*Thomson Industries, Inc., 1029 Plandome Rd., Manhasset, N. Y.* Unlimited-travel anti-friction ball bearing is for linear or reciprocating motion. Called "Series A" ball bushings, the bearings are self-contained units, each with three basic parts in addition to the balls: sleeves, pressed-steel retainer, and a pair of rings. Available for ¼-, ½-, ¾- and 1-in. dia. shafts.

PILLOW BLOCKS — *Anti-Friction Bearings Co., 2020 S. Figuero St., Los Angeles 7, Calif.* Self-aligning pillow blocks and flange units. Ground adapter sleeve is inserted so that one pillow block can accommodate number of shaft diameters. Line takes ⅝- to 3-in. shaft dia. in both pillow blocks and flange units.



PNEUMATIC WHEEL — *Aerol Co., 1823 E. Washington Blvd., Los Angeles, Calif.* The Model No. PW-1642 pneumatic wheel for materials-handling equipment is available in three axle sizes. The wheel makes it possible to change tires in less than a minute. Tire is removed by deflating until just rounded out, pressing a detachable rim by hand towards other rim until retainer spring is exposed, then removing ring, rim and tire.

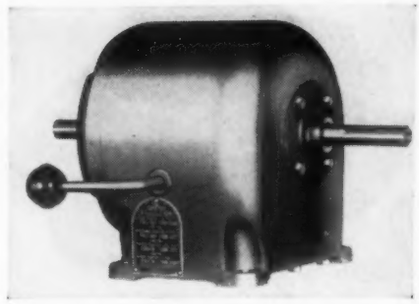
BALL BEARINGS—*New Hampshire Ball Bearings Inc., 11 Main St., Peterborough, N. H.* A line of Micro ball bearings is available in precision, solid-race, radial and pivot designs. Dimensions are English (5/32 to ⅜-in. O.D.) and metric.

BEARING ADAPTER — *Standard Locknut and Lockwasher, Inc., 311 N. Capitol Ave., Indianapolis 4, Ind.* Adapter is designed to permanently hold inner race of tapered bore bearings to straight shaft during rotation. Available to fit 1-3/16-, 1-7/16-, 1-15/16- and 2-3/16-in. shafts.

SELF-ALIGNING BEARINGS — *Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32, Ill.* As the shaft rotates, the self-aligning bearing adjusts itself within the housing to compensate for the bend in misaligned shaft.

REDUCTION UNITS—*Olson Industrial Products, Inc., 821 Washington St., Lynn 10, Mass.* Helical-gear speed reducers are single-reduction units made in four size groups, and each group has seven units with ratios from 2:1 to 9:1.

BEARING—*Fafnir Bearing Co., New Britain, Conn.* Plya-seal bearing line has been extended to include a series of double-row width bearings which actually incorporate only a single row of balls. They are designated W-PP. These bearings provide more space for grease, making for considerably longer periods between lubrication.



TRANSMISSION—*Lima Electric Motor Co., 1501 Findlay Rd., Lima, Ohio.* A selective-speed gearshift drive, Type RD, can be used with any standard motor of ¼ to 1 hp. The transmission has gear ratios of 1:1, 1.33:1, 2:1 and 4:1.

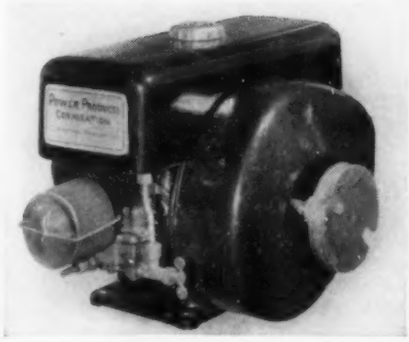
BEARINGS — *Marlin-Rockwell Corp., Jamestown, N. Y.* Synthe-Seal ball bearings are equipped with seals on one or both sides. The seals are made of soft synthetic rubber with a steel core for strength.

FOLLOWERS—*Roller Bearing Co. of America, Trenton 3, N. J.* Roller followers are heavy-walled, self-contained needle bearings. Rollers are retained by the same channel-shaped construction used in standard bearings.

TAKE-UP—*Dodge Mfg. Corp., Mishawaka, Ind.* The type SC steel-frame ball-bearing take-up for conveyor service has a ball-bearing inner unit enclosed in a cast-iron housing. Housing is provided with ways on each side for supporting guides and a hole for the unthreaded end of an adjusting screw. Also announced is type SC ball-bearing flange bearing, which is self-aligning and has deep-groove precision ball-bearing with long inner race. It is suitable for mounting against vertical or horizontal supports.

BEARINGS—*The Wel-Met Co., Kent, Ohio.* A standard line of self-lubricating cylindrical bearings made from powdered metals have a self-contained oil supply. They are designed for aircraft, automotive, machinery and motor applications.

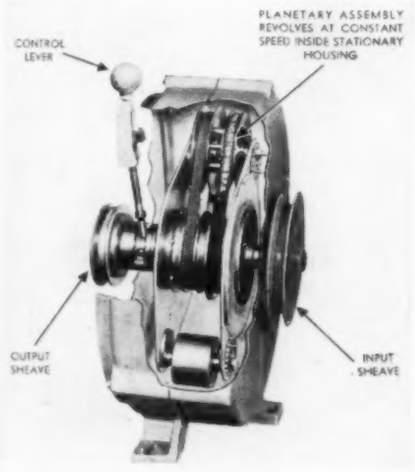
PERMANENT MAGNETIC PULLEY —*Eriez Mfg. Co., 2685 E. 12th St., Erie, Pa.* Pulley automatically separates magnetic from non-magnetic materials conveyed on a belt. It requires no electric current, is powered by large Alnico magnets.



GAS ENGINE—*Power Products Corp., Grafton, Wis.* Aluminum gasoline engine of ¾ to 1 hp., for portable and self-propelled equipment, weighs 16 lb. Single-cylinder, two-cycle, air-cooled, with dimensions 13½x11x14 in., it will operate for three hours on a tank of gas, 0.4 gal.

CLUTCHES—*V-belt Clutch Co., 3757 Wilshire Blvd., Los Angeles 5, Calif.* A V-belt friction-drive clutch known as Ball-lok clutch unit may be used either as driving or driven pulley. It is designed to grip or release directly on V-belts. Four available sizes have 3¼- to 5-in. sheave dia. and are from 2 15/16 to 3 1/16 in. long.

MULTI-PLANE CHAIN—*Leeds Electric & Mfg. Co., Hartford, Conn.* Unit can bend as much as 45° to reverse of direction of travel on either side. Designed especially for use with Leeds overhead conveyors and infra-red systems. Used on other conveyors for small radius curves and sharp bends on different planes.

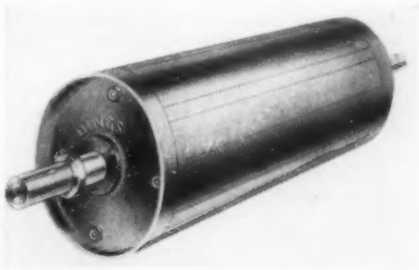


SPEED SELECTOR—*Speed Selector, Inc., Cleveland, Ohio, and The B. F. Goodrich Co., Akron, Ohio.* Improved Variable - V - Planetary infinite - ratio speed selector employs two standard cross-section V-belts. It provides any speed from 0 to 800 rpm. at constant torque from constant-speed power source. Models are available in ½-, 1- and 2-hp. output.

DOWEL PIN—*Baumbauch Mfg. Co., 1812 S. Kilbourn Ave., Chicago 23, Ill.* Unit is self-sizing, has knurled end which acts as shear when driven in. Hole is sized and irregularities removed. Pin is ground to 0.001 in. oversize.

JOINT—*Gear Grinding Machine Co., Detroit 11, Mich.* Constant-velocity universal joint, is said to be free from torsional vibrations at all operating angles and speeds. Torque is transmitted through steel balls, positioned in intersecting raceways.

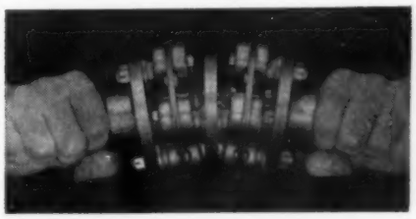
BELT—*G. H. Gilmer Div., United States Rubber Co., Rockefeller Center, N. Y.* Belt with rubber teeth that will not slip is used on machinery equipped with special pulleys grooved to fit the teeth. Belt is reinforced with steel cables embedded in oil-resisting synthetic rubber. It engages with pulleys at any speed to 10,000 fpm.



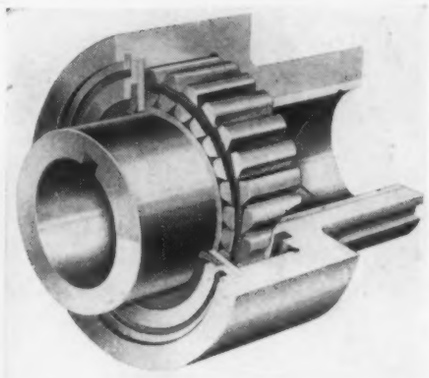
PERMA-PULLEY — *Dings Magnetic Separator Co., Milwaukee, Wis.* Permanent magnetic pulley with Alnico poles is available in 53 sizes ranging from 12-in. dia. x 12-in. width to 30-in. x 60-in. width.

PILLAR-POST UNITS—*A. W. Grunow, Inc., P.O. Box 2, West Orange, N. J.* Used for die-sets, units are adjustable for fit and future wear. Units have special steel-alloy housings. Post ends are tapered to facilitate removal.

BRASS FITTINGS — *The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.* Improved brass fittings for connecting copper, steel, aluminum and other thin-wall metal tubing have forged bodies on elbows and tees and Dryseal pipe threads on the thread ends. In the ¼-in. sizes and over, the threads are longer than the old style threads.

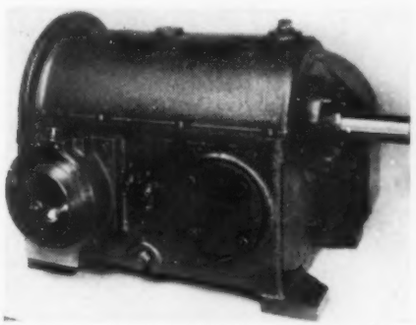


COUPLINGS—*Morse Chain Co., Detroit 8, Mich.* Double Morflex couplings are of a universal-joint type, each coupling consisting of two single couplings with a center-plate adapter. The model has twice the torsional resilience of the single coupling. The double coupling is available in 10 sizes from 13 to 725 ft. lb. torque.

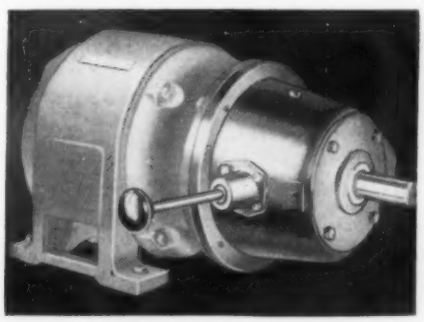


CLUTCH—*Gear Grinding Machine Co., Detroit 11, Mich.* Formsprag overrunning clutch contains a full complement of sprags in the angular space between the outer and inner cylindrical races of the clutch.

SHEAVES — *Worthington Pump and Machinery Corp., Harrison, N. J.* A and B lines of QD sheaves feature improved groove-belt fit and reinforced arm construction. The A line has groove sizes to match A-belts, and the B line is for B-belts.

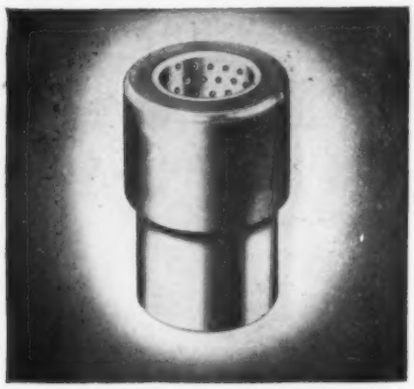


SPEED REDUCER—*Lombard Governor Corp., Ashland, Mass.* A wide-range variable-speed reducer is designed for applications where the ratio of maximum to minimum speed is large. A speed range greater than 20:1 is obtained, with minimum speed approximately zero.

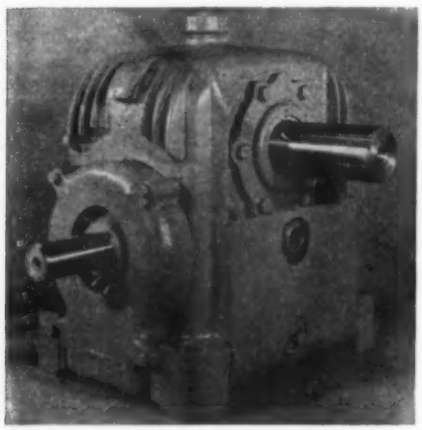


MOTOR TRANSMISSION — *Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich.* Two-speed motor transmission provides direct motor speed, neutral point, and any reduction up to 6.25:1 by means of an automotive-type gear-shift lever. Standard reductions are 1½:1, 2:1, 3:1 and 4:1.

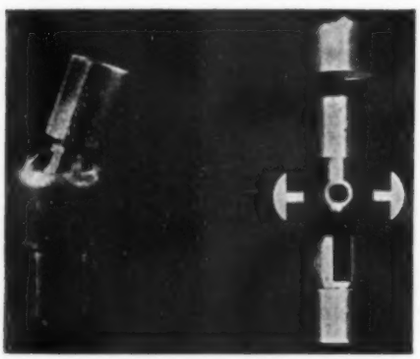
STEEL BALLS—*New Hampshire Ball Bearings, Inc., 1 Granite St., Peterborough 1, N. H.* Micro line of extra-small precision-grade steel balls is in 1-mm. (0.0394 in.) and 3/64-in. (0.0469 in.) dia. The high-carbon chrome-alloy balls are held to a size tolerance of ±0.00005 in.



BUSHINGS—*Standard Machinery Co., Providence, R. I.* Low-friction guide-pin bushings said to increase the accurate life of die sets have a special bearing-bronze liner electrolytically alloyed with indium, and are said to perform satisfactorily at pressures to 10,000 psi. Bushings are available in seven sizes, from 1 to 3 in. I.D.



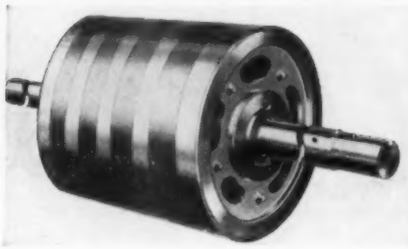
SPEED REDUCERS—*Cone-Drive Division of Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich.* Fan-cooled cone-drive speed reducers eliminate the necessity for taking thermal ratings into consideration in selecting speed reducers.



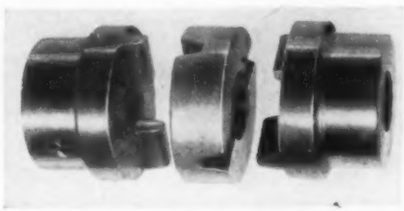
UNIVERSAL JOINT—*B. M. Root Co., York, Pa.* Unit works with "ball-and-socket" action similar to toggle joint, has only five parts. Spun cap holds other parts in place. Socket of joint provides natural oil reservoir. It is made for shafts from ¼- to ⅞-in. dia.

PISTON RINGS—*Chambersburg Engineering Co., Chambersburg, Pa.* Ceco Rings said to have wearing qualities that increase life by three times or more. Rings are heated by induction and automatically quenched and tempered.

SCREW ANCHOR—*Holub Industries, Inc., Sycamore, Ill.* All-purpose plastic expanding screw anchor can be used with wood or lag screws for fastening into any material. Anchors are made slightly larger than diameter of hole to be drilled. Design enables anchor to compress itself. Available in seven sizes in various lengths to accommodate screw sizes ranging from No. 5 to No. 20, or ¼- and 5/16-in. lag screws.



PERMANENT MAGNETIC PULLEY —*The Homer Mfg. Co., Inc., Dept. 1-31,* Lima, Ohio. Unit is used as head pulley in belt-conveyor systems to remove ferrous-metal particles and pieces from material being conveyed. Built in all standard diameters above 10 in.



FLEXIBLE COUPLING — *Industrial Machine Works, Inc., South Hanover, Mass.* Coupling has two identical end pieces with involute gear-teeth which mate with a centerpiece containing rack grooves running transversely on opposite sides. Torque capacity is to 1500 lb.-in. in standard sizes to 1-1/3-in. shaft dia.

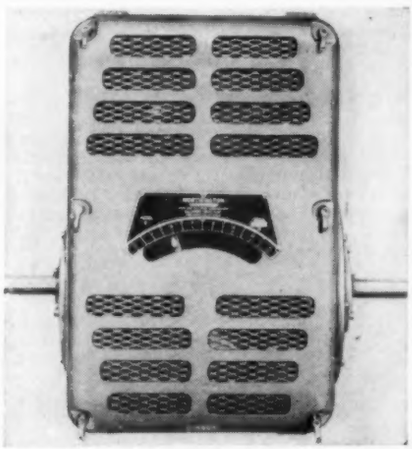
UNIVERSAL JOINT — *Curtis Universal Joint Co., Inc., Dept. D, Birnie Ave., Springfield 7, Mass.* Ball-type universal joint is said to eliminate sliding friction and minimize bearing friction. Available in ½- and ¾-in. dia. steel forks bear on a bronze ball with centerless-ground pivot bearing pins.

COUPLING—*Dodge Mfg. Corp., Mishawaka, Ind.* Pin-type flexible coupling incorporates the Taper-Lock bushing used with V-belt sheaves. Bushing is said to fasten to shaft with firmness of shrunk-on fit, and to make reboring unnecessary.

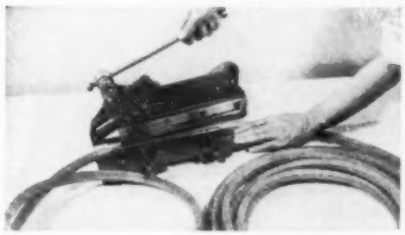
EXPANDER—*HPL Mfg. Co., 2013 E. 65th St., Cleveland 3, Ohio.* Expander for leather cup packings is produced in strip form and made of heat-treated beryllium-copper material. It is designed for air-hydraulic, fluid-sealing or any other sealing problem, and will fit any cup dia. 2 in. and over.

V-BELTS—*The B. F. Goodrich Co., Akron, Ohio.* Rayon is used as the reinforcement or tension member of all light-duty and automotive V-belts made by the firm. It is said to give 50% increase of belt life, particularly at elevated temperatures, over the cotton previously used.

GEAR BOX—*Piezo Mfg. Corp., 110 E. 42nd St., New York 17, N. Y.* The Type MG miter gear box for medium-speed power drives or hand operation with 1:1 ratio is used in the operating controls of valves, doors and other mechanical devices and in power drives of transmission equipment. Six sizes are available with ½ to 1¾ in. shaft dia.



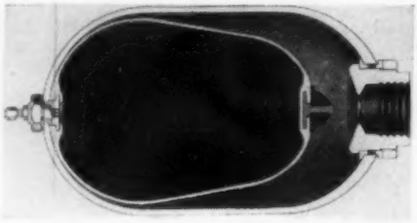
VARIABLE-SPEED UNIT — *Worthington Pump & Machinery Co., distributed by Atlantic Gear Works, 200 Lafayette St., New York 12, N. Y.* Variable-speed control reduction unit made in two new sizes. Sizes are rated at 5 and 7½ hp., and have 8:1 ratio. Earlier units are rated at 1 and 3 hp.



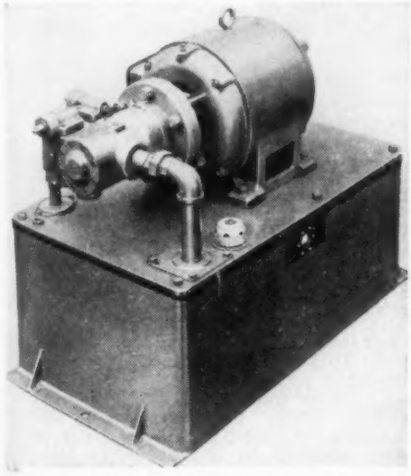
BELTING—*Chas. A. Schieren Co., 30-38 Ferry St., New York, N. Y.* Leather V-belting can be cut from a roll and spliced to fit any required centers, and is supplied in 100-ft. rolls. It can be made endless, to fit any drive, either by lapped splice or mechanical fasteners.

V-BELTS—*Dayton Rubber Co., Dayton, Ohio.* Rayon cord is now used in Thorobred V-belts. Rayon is said to minimize stretch, increase flex strength and lengthen life of spindle bearings.

STRAINER—*J. A. Zurn Mfg. Co., 1801 Pittsburgh Ave., Erie, Pa.* Strainer with an angle construction and commonly used with pumping equipment and other close-tolerance units can be installed directly upon unit. Various types are made with pressure ratings of 125, 150, 250 and 300 lb.



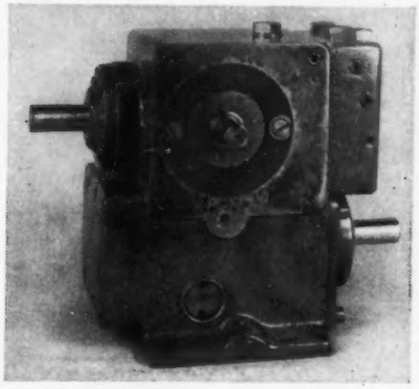
HYDRAULIC ACCUMULATOR — *Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.* A full-flow hydraulic accumulator has volumetric efficiency said to be as high as 97% with unrestricted flow up to 50 gpm. and no appreciable pressure drops in systems at pressures as high as 3000 psi.



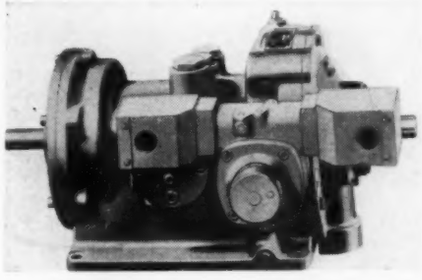
HYDRAULIC UNITS — *Machinery Equip. Div., Vickers Inc., 1400 Oakman Blvd., Detroit 32, Mich.* Power units in standard sizes and types of 20-, 30- and 60-gal. tank capacity are equipped with constant-delivery vane-type pumps. They are complete power sources for hydraulic systems. Three types of pumps are available in wide range of capacities.

COUPLING—*The Hansen Mfg. Co., 4031 W. 150th St., Cleveland 11, Ohio.* Coupling, both members of which seal automatically when disconnected, known as Hansen Series 8000, combines two-way shut-off with connecting and disconnecting on fluid lines, either hydraulic or pneumatic.

PUMP UNIT—*Baker Brothers, Inc., Toledo 10, Ohio.* Detachable hydraulic pump unit mounted on caster wheels has direct electric control of the feed, return and neutral cycle.



TRANSMISSION — *Portman Machine Tool Co., 70 Portman Rd., New Rochelle, N. Y.* Small hydraulic variable-speed transmission, Model T-1, provides infinitely variable speeds from 0 or neutral to full electric motor speed in either forward or reverse. It has a rating up to 1 hp.



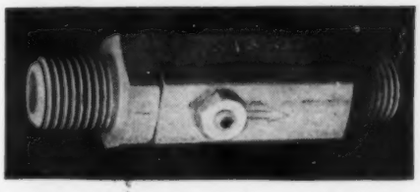
TRANSMISSION — *The Oilgear Co., 1301-1417 W. Bruce St., Milwaukee 4, Wis.* Reversible variable-speed transmission, which is smaller, lighter, and faster than previous models, consists of a volumetric, variable-delivery, radial-rolling-piston pump driving a constant-displacement radial-rolling-piston motor.

TRANSMISSION—*Machinery Equipment Div., Vickers Inc., 1410 Oakman Blvd., Detroit, Mich.* TR2-R13F13 variable-speed hydraulic transmission, for fractional-hp. machinery drives, includes stepless speed adjustment from zero to maximum output rpm. It is rated at ½ hp., continuous duty.

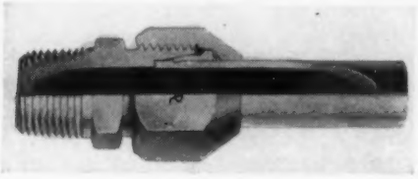
RELIEF VALVE—*Superdraulic Corp., 12835 Ford Rd., Dearborn, Mich.* A 5000 psi. relief valve for high-pressure systems is said to eliminate squealing and chatter and provide instantaneous action.

POWER PACK—*Greer Hydraulics, Inc., 454 18th St., Brooklyn, N. Y.* Hi-Lo pressure power pack for actuating huge presses can produce a flow of 124 gpm. at 2000 psi. Hydraulic circuit is powered by a dual-shaft, 30-hp. electric motor. Low-pressure accumulators operate between 300 and 200 psi. high, between 2500 and 2000 psi.

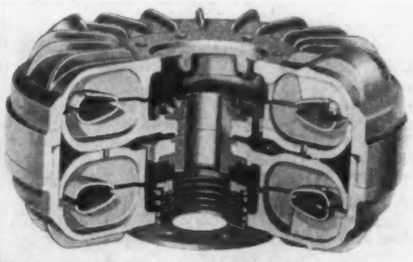
HYDRAULIC CYLINDERS—*National Hydraulic Co., Inc., 4505 Oakwood Blvd., Melvindale (Detroit), Mich.* Natdraulic hydraulic cylinder with seven standard mountings is made in bore sizes of 1 to 12 in., any stroke length, and for pressures up to 1500 psi. with a 5-1 safety factor.



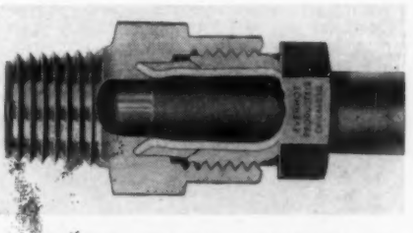
SPEED-CONTROL VALVE — *Electrol, Inc., Kingston, N. Y.* A speed control valve allows free flow in one direction, and, by means of screw-actuated metering pin, controls the flow in opposite direction. Made in ⅛-, ¼-, ⅜- and ½-in. NPT port sizes, it can be used with pressures to 1500 psi.



COUPLING — *Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.* Ferulok, a flareless coupling for heavy-wall tubing, consists of a body (made in a variety of shapes), sleeve or ferrule which engages the tube, and nut which forces the ferrule to grip the tube.



COUPLING—*Twin Disc Clutch Co., Racine, Wis.* Small hydraulic coupling is used with electric motors from 1 to 25 hp. Five models range in size from 7.4 to 10.6 in.



FITTINGS—*Everhot Products Co., 2001 W. Carroll Ave., Chicago, Ill.* Everseal self-flaring fittings are said to obtain a 37° leakproof flare and assemble in one operation.

VALVE—*The Henry Valve Co., 3260 W. Grand Ave., Chicago 51, Ill.* The pushbutton packless valve with a brass forged body is suitable for handling oil, water, air or any substance not corrosive to brass. It is normally open and designed for manual or automatic instantaneous valve operation where leakage around conventional packing is not objectionable.

REVERSING VALVE—*R. I. Task Enterprises, Inc.; distributed by Morse Boulger Destructor Co., 205 E. 42nd St., New York 17, N. Y.* The "Rite" four-port hydraulic cylinder valve obtains full reversal actuation from the cylinder itself.

HYDRAULIC UNIT—*John S. Barnes Corp., 301 S. Water St., Rockford, Ill.* The Rapidraulic Junior hydraulic clamp unit is designed for applications requiring a large volume of fluid in a short time interval, followed by a high maintaining pressure. Maintaining-pressure adjustment is to 500 psi. The motor is from ¼ to ½ hp.

STEM VALVE—*Security Valve Co., 440 San Fernando Rd., Los Angeles 31, Calif.* SE-CO packless stem valve for oxygen and acetylene cylinders is said not to freeze in either open or closed position. Gas pressure is utilized to increase seal effectiveness. Operating pressures are 1 oz. to 3500 psi., at temperatuers from 70 to 250 F.

STRAINER—*J. A. Zurn Mfg. Co., 1801 Pittsburgh Ave., Erie, Pa.* A duplex or twin sediment strainer is designed for pipe lines where continuous flow is imperative. When the strainer is to be cleaned, flow can be diverted by means of a single plug valve. Standard sizes from 1 to 6 in. are available.

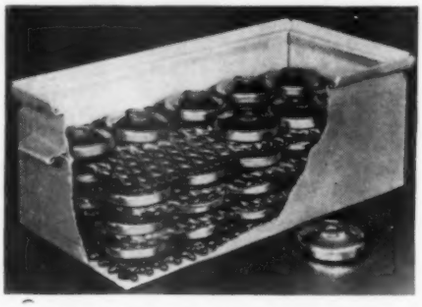
FLOW REGULATOR — *Waterman Engineering Co., 721 Custer Ave., Evanston, Ill.* Automatic flow regulator for hydraulic systems provides unlimited flow in one direction with predetermined rate in opposite direction. This provides machine tools with insurance against sudden release of hydraulic pressure.

PUMP—*Racine Tool & Machine Co., 1760 State St., Racine, Wis.* Variable-volume oil hydraulic pump is available in capacities of 12 to 30 gpm. at pressures to 1000 psi.

POWER UNITS—*Hannifin Corp., 1101 S. Kilbourn Ave., Chicago, Ill.* Improved, standardized, streamlined, hydraulic-power units are designed for use with hydraulic cylinders and other hydraulically operated equipment. Units provide for any pump capacity above 1 gpm., and for pressure to 2000 psi. or more.

CYLINDERS—*Air and Hydraulic Div., Lindberg Engineering Co., 244 W. Hubbard St., Chicago 12, Ill.* An improved line of oil-hydraulic cylinders have cylinder heads flame-cut and machined from steel mill plate. Neoprene O-rings replace conventional gaskets. Sealing action is automatic. Designed for 1500-psi. working pressure.

VALVES—*Grove Regulator Co., 65th & Hollis Sts., Oakland, Calif.* Chexflo valves, which have no operating metallic parts to stick, slam, chatter or leak, operate on low pressure differential and can handle air, gas, water and refined petroleum products at temperatures to 180° F. Sizes range from ½ to 12 in. Valve has sensitive synthetic rubber lip.

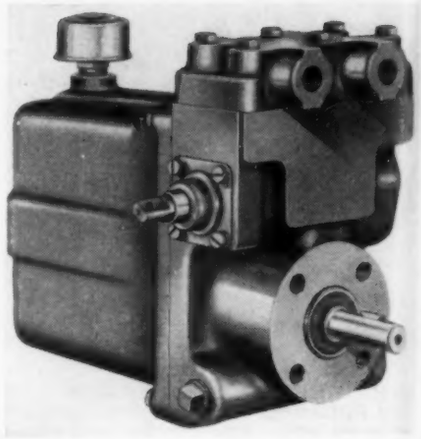


SEPARATORS—*Automotive Rubber Co., Inc., 8669 Epworth Blvd., Detroit 4, Mich.* Made of woven wire screen (or expanded or perforated metal) in all mesh and sizes they are completely covered with rubber. They will keep parts from becoming scratched, and can be used for palletizing, stacking or draining.

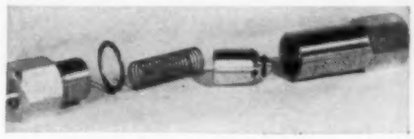
VALVE—*Electrol, Inc., Kingston, N. Y.* Relief valve for use with mineral-oil systems features a close-fitted piston working in oil which serves as a dampening device to prevent squealing or chattering. The unit is made in two models, both wide range from 500 to 2100 psi. Model 523-8 has 6-gpm. maximum flow, and Model 523-14 has 16-gpm. maximum flow.

CYLINDERS—*Hydro-Line Mfg. Co., Rockford, Ill.* A line of standard hydraulic cylinders includes all conventional types of mountings and ranges from 1½- to 8-in. bore with stroke to suit. Cylinders are rated at 1500-psi. capacity.

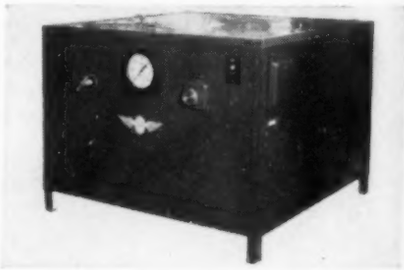
HYDRAULIC-POWER UNIT—*Hufford Machine Works, Redondo Beach, Calif.* Self-contained with motor, pump, valves, and flow control mounted above fluid reservoir and filter system, the unit activates any hydraulically driven machinery with both forward and reverse motion by means of selector valves.



POWER PACK—*Vickers, Inc., 1410 Oakman Blvd., Detroit 32, Mich.* A hydraulic unit, the Power Pack, is self-contained "package." It can be attached to any power drive, directly, with V-belt, chain drive or gears. It weighs 45 lb. It is available with delivery of 2, 3 or 5 gpm. at 1200 rpm. and 1000 psi.



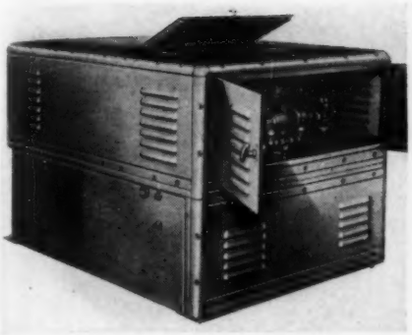
CHECK VALVE—*Mansfield & Green, Cleveland, Ohio.* Check valve has a double seal to eliminate leakage and loss of pressure. Sizes vary from ⅛- to 1-in. standard pipe thread. Pressure range is 10,000 psi. Grit as large as 0.010-in. dia. is said not to cause leakage.



POWER PACK — *Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.* The Model CBP-1, a hydraulic power pack, is self-contained and can be used to supply large volumes of fluid under controlled pressure to presses or similar machines for power. Fluid stored under pressure in a 10-gal. storage chamber is released instantly and supplied to the press during the work cycle, returning to the reservoir at the end of cycle.

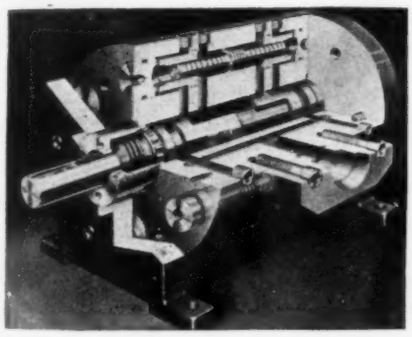
MICRONIC FILTER—*Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.* A micronic filter, with capacity of 300 gpm. at pressures up to 250 psi. can be installed on either suction or pressure side of pump. It incorporates a filter said to eliminate particles as minute as 5 microns.

TUBE FITTING—*Brockway Co., Naugatuck, Conn.* Uniflare two-piece self-flaring tube fitting is designed so that the nut, body and thrust-collar serve as an extrusion press, the thrust collar shearing from the nut when wrench pressure is applied. Nut grips tube and forces it into body of fitting to produce a 37° flare. Sizes are ⅛ to ¾ in.

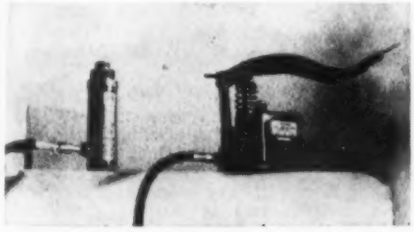


POWER UNITS—*Vickers Inc., 1410 Oakman Blvd., Detroit, Mich.* Custom-built hydraulic power units for special installation requirements can be built to include all necessary valves, pumps, motors and piping in one self-contained unit.

HYDRAULIC CYLINDER — *Bristol Machine Tool Co., 913 Wood St., Bristol, Pa.* A 1500 psi. oil hydraulic cylinder is for machine-tool applications. By the use of simple attachments, nine standard mountings can be had from the same basic cylinder. A built-in-self-adjusting cushion is in each end.

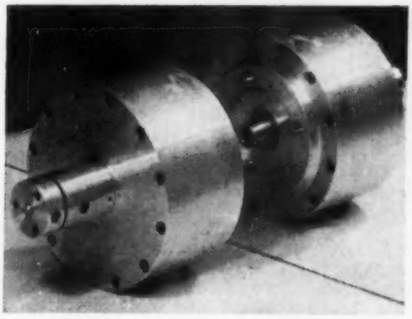


PRESSURE BOOSTER — *Hydro-Power, Inc., Belmont & Sheridan Aves., Springfield, Ohio.* An oil-hydraulic pressure booster, capable of supplying pressure up to 7500 lb., is made in two sizes: 35 and 100 gpm. input. Each is available in two pressure ranges: 2¼ to 1 and 3 to 1. Volume output is in inverse proportion to pressure.

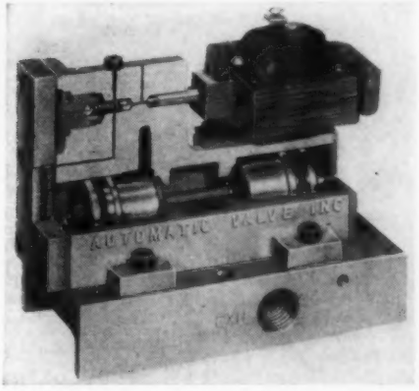


HYDRAULIC UNIT—*Munton Mfg. Co., Franklin Park, Ill.* Hydraulic "Mobilepower" unit with 7-ton capacity and 3-in. stroke is foot operated and weighs 45 lb. With attachments it can be used as a puller, press, lifter, spreader, "C" clamp or jack.

AIR CYLINDER—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Non-cushion type air cylinder uses threaded caps to eliminate tie-rods between the caps and cylinder barrel for positive seal. Made in 2-, 2½, 3- and 4-in. dia. with optional stroke lengths.



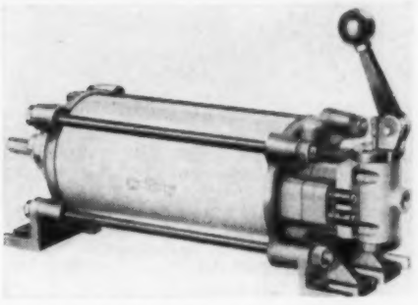
AIR CYLINDERS — *Skinner Chuck Co., New Britain, Conn.* Aluminum high-speed rotating air cylinders are recommended for installations on machines operating at speeds up to 3,000 rpm. Made in sizes 4½ to 12 in. in diameter from alloy forgings which eliminate the porosity normal in aluminum castings.



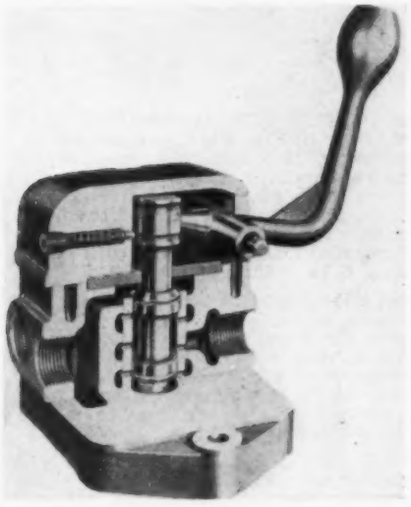
AIR VALVE—*Automatic Valve, Inc., 37415 Grand River, Farmington, Mich.* A three-way, three-port, solenoid-operated air valve known as SV-3, is designed to control single-action air cylinders actuating machine-tool operations. It is lightweight and compact. It is a balanced-piston type. Made in ¼, ⅜, ½ and ¾ in. sizes, it has no metal contacts.

AIR FILTER—*C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo.* Unit incorporates plastic bowl to eliminate oil emulsion moisture and solid impurities from compressed-air lines. Moisture is thrown against walls of bowl, collects and runs into "quiet" zone below baffle plate.

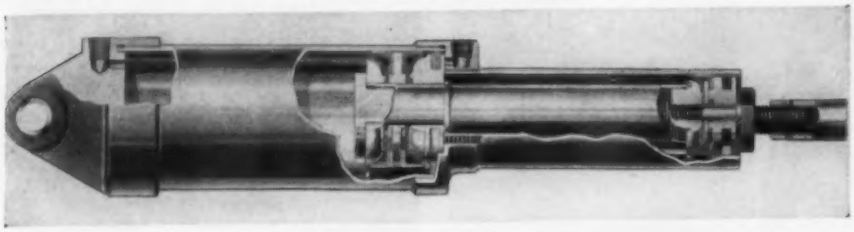
VALVE—*Dayton Rogers Mfg. Co., Minneapolis 7, Minn.* A combination reducing regulating valve and pressure gage is made in four sizes: ¼, ⅜, ½ and ¾ in. pipe-size connections. Units can be used on all shop airlines and regulate pressure from 5 to 150 psi.



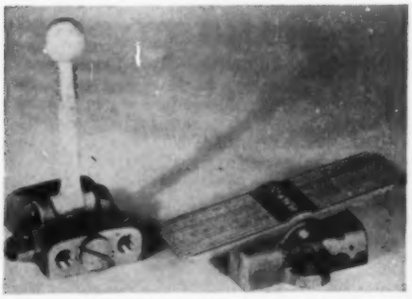
AIR MOTOR—*The Bellows Co., 222 W. Market St., Akron, Ohio.* A heavy, reciprocating, non-rotating air motor, known as BM15, has 4½ in. bore and develops a piston thrust of 15 times air-line pressure from any given line pressure up to 175 psi. Unit is available in stroke lengths of 1½, 3, 6 and 9 in.



AIR-CONTROL VALVES—*Logansport Machine Co., Inc., 905 Center Ave., Logansport, Ind.* The balanced construction produces equal pressure on both sides of the piston. Valve seats and rod packing are eliminated. Valves come in 79 standard models, including direct- and remote-control models.



DIFFERENTIAL AIR ENGINES—*National Pneumatic Co., Industrial Sales Div., Rahway, N. J.* Engines operate with only one controlled air line. At 100 psi., engines cover range from 100- to 1335-lb. on in-stroke, and 105- to 1070-lb. on out-stroke. Pressure acts on large and small ends of piston assembly, resulting in force equal to difference between two areas.



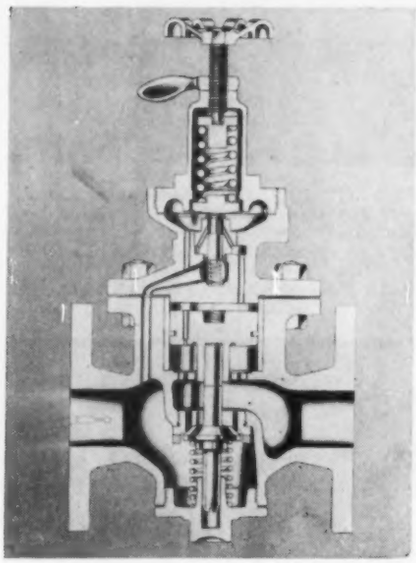
VALVE—*Ross Operating Valve Co., Dept. K, 6489 Epworth Blvd., Detroit 10, Mich.* A small poppet-type valve for operation of light machine tools, vises, and other machinery adaptable to air control, can be three- or four-way in either lever or treadle types. Available in locking, non-locking or neutral-position types.

AIR CYLINDER—*Anker-Holth Mfg. Co., Port Huron, Mich.* An adjustable-stroke air cylinder has, besides the regular double-acting piston, a stop piston for setting required stroke. The stroke is adjusted by turning the hand-wheel at right end of cylinder. Unit illustrated has 4½-in. bore with stroke from 6 to 8 in.

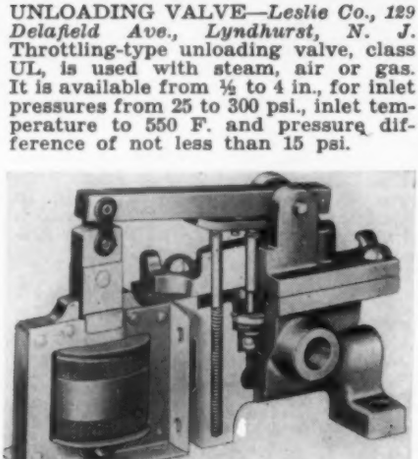
VALVE—*Knox Industries, Inc., Lexington, Mich.* The "Air-Miser" four-way air valve has bypass port in bronze disk which allows half of the compressed air used in power stroke of a double-acting air cylinder to be used to return piston. Design reduces compressor load and volume 50%.

REGULATOR—*Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill.* Air-pressure regulator is used with pneumatic cylinders and air-powered equipment. Self-contained valve is of the diaphragm type.

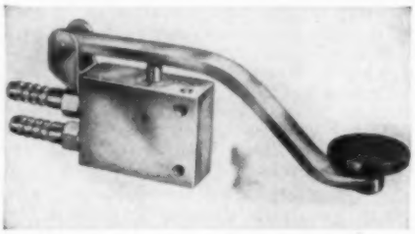
AIR MOTOR—*Gast Mfg. Co., Benton Harbor, Mich.* No. 1 explosion-proof air motor is a 2½-lb. 2¼-in. dia. model. It can run at constant low speed, such as 100 rpm., without stalling. Speed is 0 to 6000 rpm., hp is from 0 to 1/6.



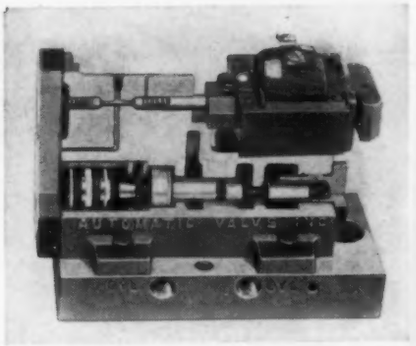
UNLOADING VALVE—*Leslie Co., 129 Delafield Ave., Lyndhurst, N. J.* Throttling-type unloading valve, class UL, is used with steam, air or gas. It is available from ½ to 4 in., for inlet pressures from 25 to 300 psi., inlet temperature to 550 F. and pressure difference of not less than 15 psi.



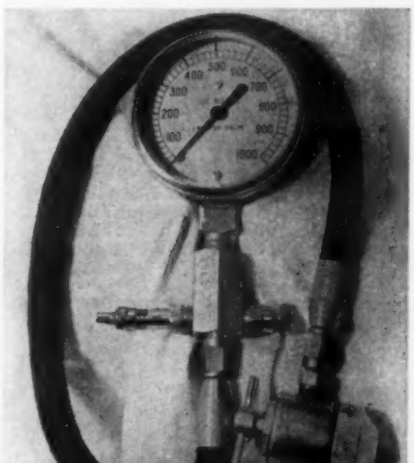
AIR VALVE—*Crescent Valve Co., 6073 State St., Huntington Park, Calif.* A fast-acting four-way air valve incorporates stainless-steel balls traveling between opposed, closely aligned brass seats. It is lever actuated, and can be operated continuously. The valve is made in ¼-in. size. It is recommended for pressures to 140 psi. Available for hand, foot, or cam operation.



THREE-WAY VALVE—*Mead Specialties Co., 4120 N. Knox Ave., Chicago 41, Ill.* Three-way fingertip valve has capacity to handle cylinders up to 4-in. bore or more.



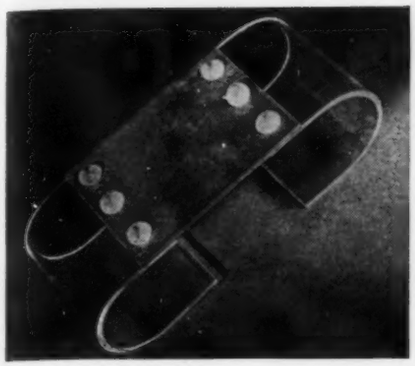
AIR VALVE—*Automatic Valves, Inc., 37415 Grand River Ave., Farmington, Mich.* Model SV-4 four-way, four-port air valve, designed for controlling air cylinders actuating machine-tool operations, is small enough to be mounted close to cylinder. Made in ¼, ⅜, ½ and ¾ in. sizes. It is also made in a five-port type for differential air pressures from 0 to 150 lb.



AIR GAGE AND HOSE—*Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.* Assembly used to facilitate charging hydro-pneumatic accumulators and similar vessels with air under pressure from regular shop line. Bleed valve relieves vessel pressure if gage reading is too high.

RIVET GUN—*Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.* A rivet hand gun operating on the ratchet principle and especially designed for jobs entailing small quantities of large Cherry blind rivets (7/32, ¼ and 9/32 in.) is 29 in. long and weighs 4½ lb. With an adapter, it can install smaller rivets.

CAPSCREWS — *Holo-Krome Screw Corp., Hartford 10, Conn.* Flat-head socket capscrews are made from a special-analysis alloy steel. All parts of the screw except the threads are cold forged.



PLEXIGLAS RIVETS—*Douglas Aircraft Co., Santa Monica, Calif.* Rivets made of Plexiglas, which can be used to fasten light metals, plastics, and other materials, can be clinched without shock by heating and expanding the rivet with air pressure. Two models of combined air and heater guns are available.

FASTENING DEVICES—*South Chester Corp., 308 Boulevard Bldg., Detroit, Mich.* Three fastening devices are made for metal, metal housings and wood. A blind rivet made of anodized aluminum alloy can be fastened by a hammer blow. A screw fastener can accommodate various thicknesses of metal housings and employs a Tinnerman-type nut which is riveted to the inner sheet. The other device, composed of a screw and an expanding nut, is designed for plywood. It can be pressed into a drilled hole and may be blind if desired.

SPRING NUT—*George K. Garrett Co., 1421 Chestnut St., Philadelphia 2, Pa.* Diamond G spring nut is said to assure positive locking operation on the bolt in one assembly operation. A spring locknut also is announced.

STEEL—*Timken Roller Bearing Co., Canton 6, Ohio.* New type of graphitic steel known as 91140 is used in lathe ways. Presence of free graphite and carbide is said to give this steel great resistance to wear and ability to retain lubricant.

DIE STEEL—*Vanadium-Alloys Steel Co., Latrobe, Pa.* Speed-cut, a die steel with a composition suitable for plastic molds and die-casting dies, is said to machine as readily at 300 Brinell as other steels used for this purpose in their annealed state.

CLAD STRIP—*Superior Steel Corp., Carnegie, Pa.* A rolled nickel- or Monelclad strip combines corrosion resistance and the strength of nickel with the properties of steel. Cold rolled strips are available in 0.01 to 0.125 in.; hot-rolled in 0.095 to ¼ in. Cladding is furnished on one or both sides. Standard clad thickness is 10% of total.

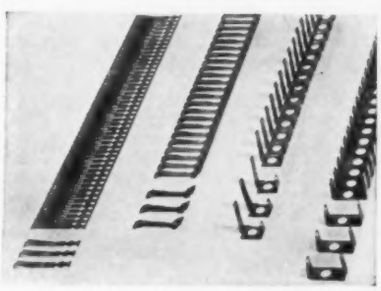
GROUND FLAT STOCK—*The L. S. Starrett Co., Athol, Mass.* Two types of precision-ground flat stock. The oil-hardening type is a non-deforming, electric-furnace tool steel for precision parts requiring accuracy of size after hardening. The water-hardening type is a high-grade tool steel annealed for easy machining. It develops maximum hardness when quenched in water or brine. The stock comes 18 in. long, ⅛ to 6 in. wide and 1/64 to 1 in. thick., and is held to 0.001-in. tolerance on the flat sides.

TOOL STEEL—*Marshall Steel, 228 N. LaSalle St., Chicago 1, Ill.* A "prefabricated" carbon tool steel is designed to eliminate cutting to size, shaping or planing, and grinding operations for steel buyers. It comes in 18-in. lengths and varies from 1/64 to 1¼ in. thick and ¼ to 10 in. wide.

ALLOY—*Bunting Brass & Bronze Co., Toledo 9, Ohio.* A non-corrosive alloy, No. 183 is a nickel-silver with high resistance to corrosion by fruit acids, food acids, lactic acids and other organic acids which might be encountered in food machinery.

WIRE—*Scovill Mfg. Co., Waterbury 91, Conn.* Extruded cold-heading wire comes in two principal tempers for fabricating brass rivets or screws by heading and extruding, or heading and drilling. Coils are available from 0.060- to 0.128-in. gage with I.D. approximately 12 or 14 in., and over 0.128-in. gage with I.D. approximately 12, 14, 15, or 16 in.

TOOL STEELS—*The Carpenter Steel Co., 109 W. Bern St., Reading, Pa.* An improved set of 12 matched tool steels are interrelated so that each takes up the work where the other leaves off. Three air-hardened steels have been added. Two additions have been made to the Red-Hard steels.



CONTINUOUS SPRINGS — *Instrument Specialties Co., Inc., Little Falls, N. J.* A continuous-strip production method provides savings in assembly and handling time of springs and small stampings. Attachment is strong enough to keep lengths intact during manufacture and handling, but individual pieces easily snap off for assembly.

DIE STEELS—*Latrobe Electric Steel Co., Latrobe, Pa.* Desegatized brands of dispersed-segregate die steel are said to have exceptionally high impact strength. They are being made in four high-carbon, high-chrome grades.

STAINLESS-CLAD STEEL — *Lukens Steel Co., Coatesville, Pa.* A line of Stainless-Clad Steels (a light layer of solid stainless steel bonded to a backing plate of carbon or low-alloy steel) is available in plate gages to over 3 in. thick, up to 162 in. wide and in formed heads of all styles to 18-in. dia.

STEEL—*LaSalle Steel Co., Box 8600A, Chicago 80, Ill.* Stressproof steel is high-carbon, cold-finished steel bar said to combine primary desirable characteristics of high strength, free machinability, excellent wearability, and minimum warpage.

MOLYBDENUM TUBING — *Callite Tungsten Corp., Union City, N. J.* Seamless molybdenum tubing is available in sizes from 0.040- to 0.500-in. O.D., and in lengths to 9 in. Other diameters may be obtained on special order. It can be welded, shaped or machined.

ALLOY—*Westinghouse Electric Corp., 306 4th Ave., Box 1017, Pittsburgh 30, Pa.* Hiperco, a magnetic alloy for light-weight electric motors is 35% cobalt, 64% iron and 1% chromium. It is said to have the highest magnetic saturation point of any known metallic material.

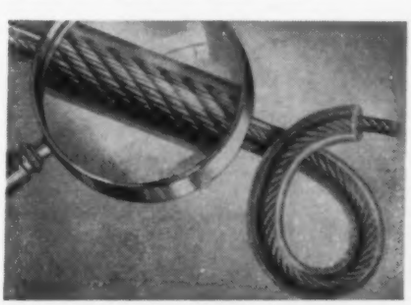
FORGED GASKETS—*Steel Improvement and Forge Co., Cleveland 14, Ohio.* Gruv-Seal forged gaskets for valves, valve bonnets and flanged connections for high-pressure and -temperature pipelines are used where connections must be easily disassembled. It is possible to make a connection by wrench pressure as tight as a weld.

ALUMINUM COATING — *American Chemical Paint Co., Ambler, Pa.* "Alodine," is a material which simultaneously coats and seals aluminum. Aluminum to be "Alodized" is treated for two minutes or less in a chemical solution heated to a temperature no higher than 120 F. The work is dried or rinsed (if it is to be painted or waxed).

ALUMINUM SHEET—*Aluminum Sales Div., Reynolds Metals Co., 2500 S. 3rd St., Louisville 1, Ky.* Coiled and flat embossed aluminum sheet offers two patterns, "ribs" (approximately ⅛ in. wide) lengthwise or crosswise on the sheet, and "stucco," an irregular, distorted pattern. Flat sheet from 0.010 to 0.032 in. thick, and coiled sheet from 0.010 to 0.020 in. thick are available

POLYSTYRENE—*Plastics Div., Monsanto Chemical Co., Springfield, Mass.* Lustrex, a polystyrene which can withstand scalding and actual boiling for short periods of time, is said to have improved physical and molding properties with a flexural strength of 12,000 to 14,000 psi. Heat-distortion point is 190 F.

POLYBLENDS—*B. F. Goodrich Chemical Co., Rose Bldg., Cleveland 15, Ohio.* Geon 500 series polyblends are said to be of special interest to extruders as they combine the toughness and chemical resistance of Geon polyvinyl chloride with the solvent resistance, flexibility and non-extractability of Hycar nitrile rubber.

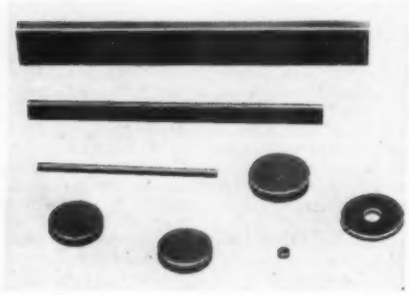


NYLON CABLE—*The Danielson Mfg. Co., Danielson, Conn.* Cable with 6/32- or 7/32-in. O.D., cable has a 3/32-in. steel wire-rope core of 920 lb. break test. Danco Nylon is impregnated onto the core.

STRIPPER—*The Chemco Products Co., Inc., Chicago, Ill.* Unisol Liquid, for stripping wood or metal enameled and painted parts was developed to provide a fast-acting, non-toxic stripping and cleansing agent. Five minutes immersion in the non-flammable solution is said to leave any painted or enameled part completely cleaned, ready for repainting.

PLASTIC—*B. F. Goodrich Chemical Co., Cleveland, Ohio.* Geon resin 100-X-26 is a paste-forming plastic. Products that can be made from the material include coatings for paper and fabric, thin films for raincoats and curtains, and thicker sheets for upholstery or shoes.

SENSITIZED-PAPER—*Eastman Kodak Co., Rochester 4, N. Y.* Silver-sensitized paper for reproducing engineering drawings on blueprint or direct-process equipment called Kodagraph Autopositive, embodies new type emulsion producing positive copy directly from a positive original. After printing, paper can be processed in normal room light.



CARBIDE DISKS, STRIPS—*Carboloy Co., Inc., Detroit 32, Mich.* Three cemented-carbide products—solid disks, disks with holes and solid strips are announced. Solid disks are furnished in 10 sizes ranging from ⅛- to 1-in. dia. There are 12 sizes of disks with holes, and 21 sizes of solid-carbide strips.

WATER-SHEDDING LIQUID—*Enthone, Inc., Dept. AM, 442 Elm St., New Haven, Conn.* Hydrex, a water-displacing liquid for drying metals, is said to have a high penetrating power to displace water from blind holes and crevices.

CLEANING COMPOUNDS—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.* A series of 17 different products includes cleaners for ferrous and non-ferrous metals; cleaners for use prior to painting or vitreous enameling; electrolytic cleaners; and special-purpose compounds. It is known as the Houghto-Clean 200 Series.

ENAMEL STRIPPER—*Enthone, Inc., Dept., AM, 442 Elm St., New Haven, Conn.* Enamel Stripper S-45 for removal of synthetic enamel and other coatings is applied by brush, spray or dip. Evaporating retardent keeps agent on work until wrinkling action takes place and enamel can be brushed, wiped or scraped off. No residue is left.

PREPAINT — *Technical Processes Div., Colonial Alloys Co., Ridge Ave. & Crawford St., Philadelphia 29, Pa.* Prepaint, a material to be applied to aluminum and aluminum alloys before painting or lacquering is applied at room temperature by dip, spray or brush. It reacts chemically and bonds in 15 to 60 sec. in a single treatment.

COATING—*Plastic-Seal Div., Globe Imperial Corp., 2014 Kishwaukee St., Rockford, Ill.* Plastic-Seal, for protecting surfaces from rust, corrosion and damage, features controlled variable thickness of coating from 0.045 to 0.064 in., and the use of colors and water-clear coating. Coating is applied by dipping in molten Plastic-Seal at 350 to 370 F.

PLASTIC-BONDED ROD—*Wall Colmonoy Corp., 19345 John R., Detroit, Mich.* Colmonoy plastic-bonded rod in 5-lb. coils is supplied in ⅛- and 3/16-in. dia. As rod passes through flame of metallizing gun, plastic burns out, leaving Colmonoy particles deposited on surface. Thickness of deposit is from 0.010 to 0.125 in.

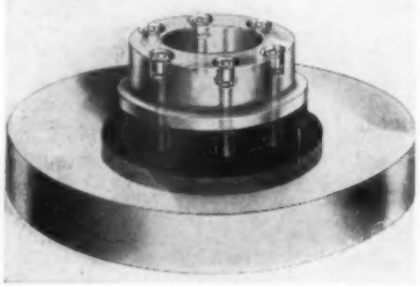
BELTING—*Jules Borel & Co., Kansas City 6, Mo.* Plastic belting is called Fuse-Ite. An endless belt is created by touching the two ends to a properly heated surface and placing them in direct contact. It is said to resist temperature extremes and acids up to 20% in strength. Available in flat, V-belt or round type from 1- to 15-mm. dia.

PROTECTING COMPOUND—*Eronel Industries, 5714 W. Pico Blvd., Los Angeles, Calif.* Thermo-dip N.S., a plastic hot-melt compound for protecting tools, cutting gears and other parts from corrosion, abrasion, shipping and handling, possesses high tensile strength. It is said to be resistant to salt water, high humidity and low temperature.

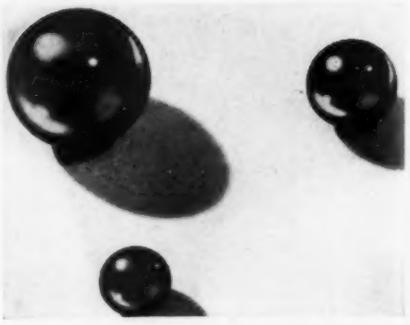
COATING — *Dennis Chemical Co., 2700 Papin St., St. Louis, Mo.* "Redskin," a protective, liquid-plastic coating for polished or bright metal, may be applied by brush, spray or dip, and is said to quickly form a tough, elastic film impervious to rust, chemical action or normal handling. Its red color warns against rough handling.

PLASTIC COATING—*Amercoat Div., American Pipe and Construction Co., P.O. Box 3428, Terminal Annex, Los Angeles 54, Calif.* American No. 40, a plastic coating for use on rubber, rubber belting and cotton belting, is said to combine properties of synthetic rubber with chemical resistance of Vinyl resins.

CUTTING METAL—*Willey's Carbide Tool Co., 1340 W. Vernor Highway, Detroit 1, Mich.* A universal cutting grade of Willey's metal, known as 606 is said to lend itself to all steel-turning applications on all types of steel.



MACHINING CARBIDES — *Carboloy Co., Inc., Box 237, Roosevelt Park Annex, Detroit 32, Mich.* Carbide parts can be mounted or attached with screws, bolts, studs or other fastening devices in the same manner as parts made of softer metals. Parts as small as 5/16-in. O.D. and ⅜ in. thick (such as replaceable solid-carbide punch ends) can be mounted.



SOLID CARBOLOY—*Carboloy Co., Inc., Detroit 32, Mich.* Cemented-carbide balls are ground to 0.0002-in. tolerance on the diameter. Used in check valves and for sizing and burnishing, they are standard only in Carboloy grade 44A. Ten sizes run from ⅛- to 1-in. dia.

CEMENTED-CARBIDE ROD — *Carboloy, Inc., Detroit 32, Mich.* Lengths of solid Carboloy cemented-carbide rod, unground and in both specific and random lengths, are available in 15 standard stock diameters from 1/64 to ⅜ in.

METALLIC PACKING—*Rodpak Mfg. Co., San Francisco, Calif.* An improved floating-seal metallic packing said to eliminate leakage completely without reducing the flexibility of the original unit, can be used for both rod- and plunger-type applications, and for all types of compressors.

RUST REMOVER — *Allied Products Co., 1133 W. Newport St., Chicago 13, Ill.* CorOdex, a liquid rust remover, is said to be effective on any metal surface. It can be applied with paint brush, cotton swab or dipping. Long immersion coats surfaces with blue-black oxidized finish.

THREAD COMPOUND—*Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.* C-5 Hi-Temp thread compound is said to prevent freezing and galling of metal surfaces at temperatures as high as 1800 F.

GRAIN CEMENT—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* A grain cement and thinner serves as an adhesive for polishing wheels. The materials are mixed and then worked onto dry wheels.

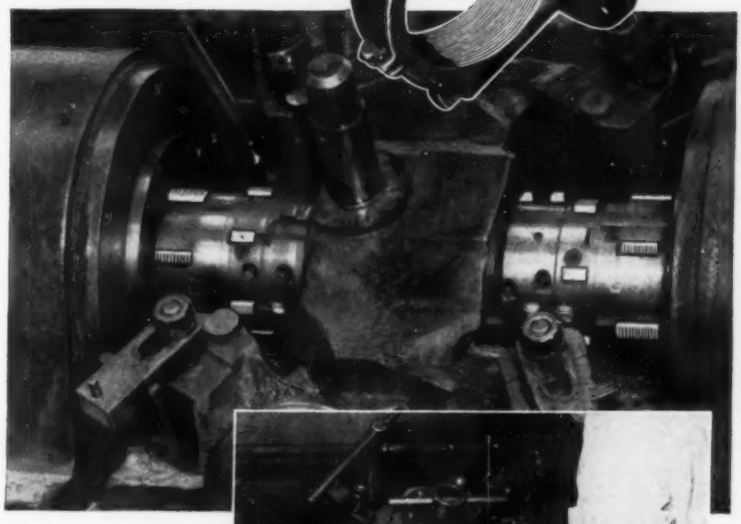
MASKING LACQUER — *Michigan Chrome & Chemical Co., 6340 E. Jefferson Ave., Detroit 7, Mich.* Miccrostop, a neutral stop-off lacquer, is said to provide hairline demarcation in masking parts prior to selective plating. It can be applied by brush, dip or spray and is said to have rapid air-drying qualities.

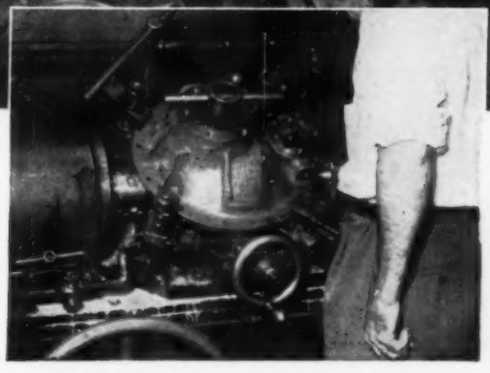
MASKING LIQUID—*The Servwell Products Co., Inc., 6523 Euclid Ave., Cleveland 3, Ohio.* Plask, a plastic paint-spray protector, it is applied with a brush like paint, dries in less than 5 min., and peels off in large sheets. One thin coat is required, and one gal. spreads about 200 sq.ft.

STRIPPABLE PLASTIC—*Eronel Industries, 5714 W. Pico Blvd., Los Angeles, Cal.* Spray-Peel, a strippable plastic compound, is applied by brush of spray, is quick-drying and has adhesive qualities to give sealing and tensile properties to provide stripping. It is said to have high resistance against moisture, abrasion, aromatic spirits and oils, acids and alkalies.

bore ream thread

IN *ONE* OPERATION





The operation pictured here is typical of the practical economy made possible by the use of Murchey engineered tools.

The work piece is a truck differential carrier. It is assembled with both caps and machined on a double end unit equipped with Murchey special machine taps with rear pilots and forward boring and reaming heads.

The tools enter simultaneously from both sides to rough bore, finish bore, ream and thread in one operation. The reaming tolerance is .001", the threads are class 3 with pitch diameter tolerance .003".

Photographs, courtesy of Eaton Manufacturing Co., Cleveland, Ohio.

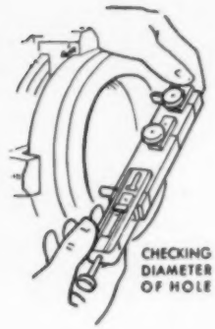
MURCHEY MACHINE & TOOL CO.
Detroit 26, Mich.

LOWER COST PER THREAD — If you want to cut your threading costs on standard or special jobs, consult a Murchey Engineer.

MURCHEY

2849

SUBSIDIARY OF THE SHEFFIELD CORP.
DAYTON 1, OHIO, U. S. A.

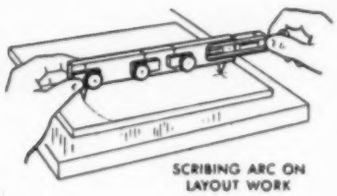


CHECKING DIAMETER OF HOLE

SHORT CUTS

in precision measurement

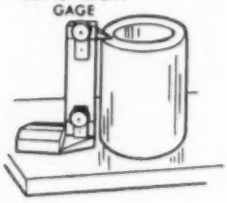
Transferring the precision of the gage block to the work without time-taking precaution is one of the outstanding advantages of Webber Heavy Duty Gage Blocks and Holding Fixtures.



SCRIBING ARC ON LAYOUT WORK

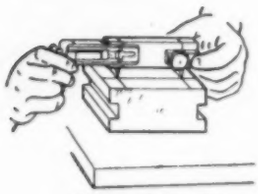
Blocks can be assembled in a few seconds with the Webber holding fixtures and clamps and used as special purpose gages, dividers, scribers, height gages and snap gages. Their rugged construction yields micro-accurate results month after month without any special attention. *Write for bulletin.*

USING HEIGHT GAGE

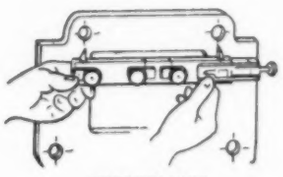


WEBBER GAGE COMPANY

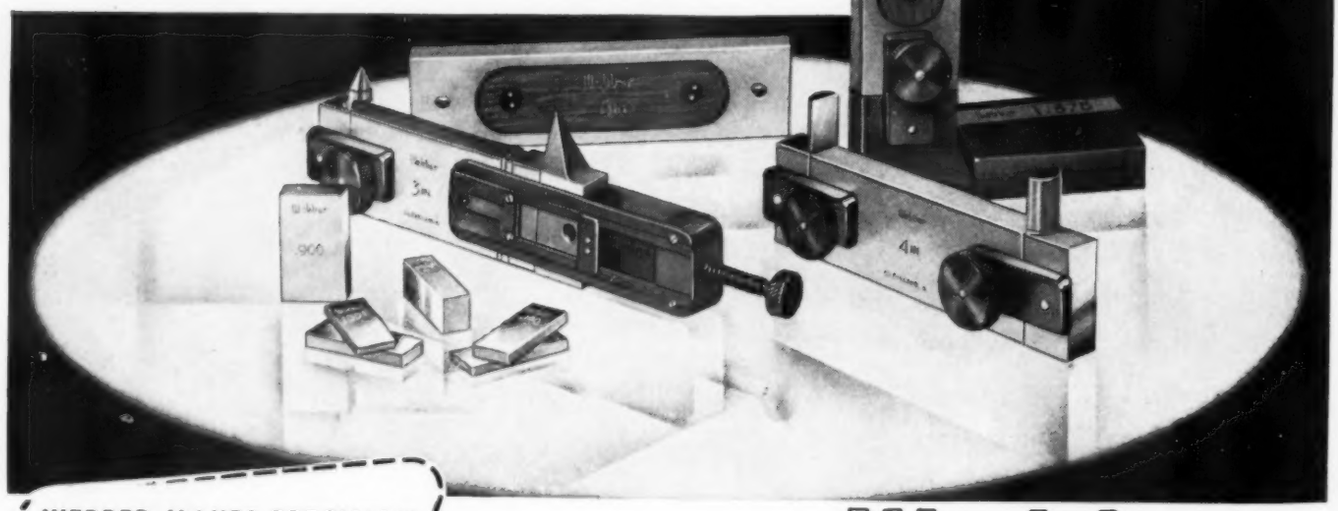
12901 TRISKETT RD. CLEVELAND 11, OHIO



CHECKING PRECISION LAYOUT

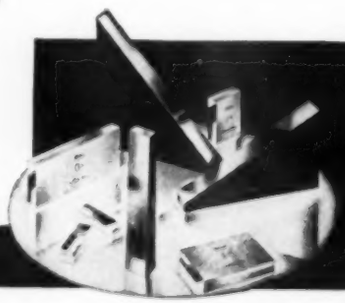


CHECKING HOLE LOCATIONS



WEBBER MAKES PRECISION GAGE BLOCKS EXCLUSIVELY

- ★ Gage Block Sets in Steps of .00005".
- ★ Individual Special Size Blocks.
- ★ Heavy Duty Gage Blocks.
- ★ Angle Gage Blocks in Steps of one second.
- ★ Carblox (Carbide) Wear Gages.



Webber

PRECISION GAGE BLOCKS

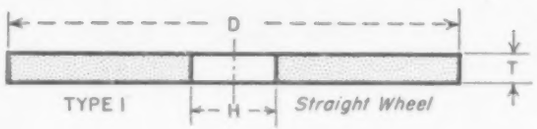
Wheels for Grinding Tools—

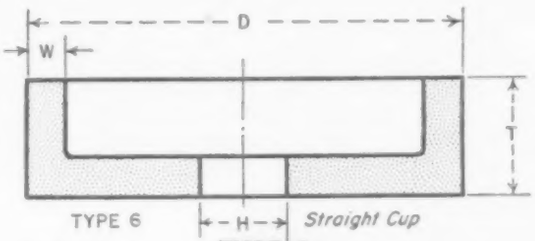
BROACHES, CUTTERS, REAMERS AND TAPS

SOURCE: SIMPLIFIED PRACTICE RECOMMENDATION R45-47

Type 1: Standard Sizes[a]—All Bonds: Vitrified, Silicate, Resinoid, Rubber, and Shellac

D	T			H
*6	*¼	*⅜	*½	* ¾
*6	*¼	*⅜	*½	*1 ¼
*7	*¼	*⅜	*½	* ¾
*7	*¼	*¾	*½	*1 ¼
*8	*¼	*⅜	*½	* ¾
*8	*¼	*⅜	*½	*1 ¼

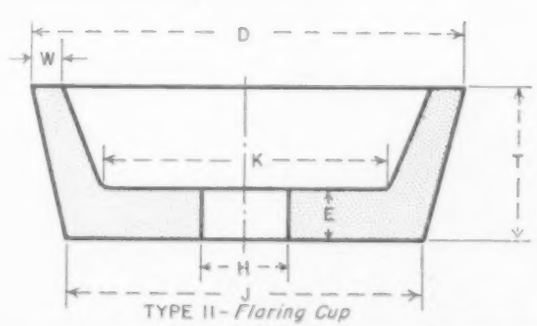


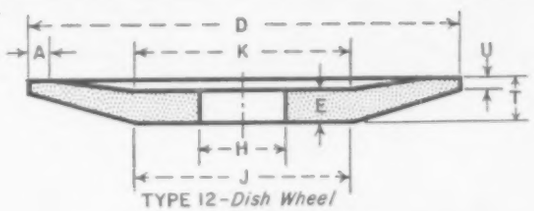


TYPE 6: STANDARD SIZES[a]—BONDS AS INDICATED[b]

D	T	H			W	E[c]
		Minimum	Maximum	Recommended		
¾	¾	⅛	3/16	⅛	3/16	3/16
1	1	3/16	5/16	¼	¼	¼
1 ½	1	3/16	⅜	¼	¼	¼
2	1 ¼	¼	½	⅜	5/16	5/16
2 ½	1 ½	⅜	⅜	½	[d] ⅜	⅜
3	1 ½	½	¾	½	[d] ⅜	⅜
3 ½	1 ¾	½	1 ¼	1 ¼	[d] ⅜	⅜
*4	*1 ½	*½	*1 ¼	*1 ¼	*[d] ⅜	*⅜
4	1 ½	½	1 ¼	1 ¼	[d] ½	½
4	2	½	1 ¼	1 ¼	[d] ½	½
4 ½	1 ½	½	1 ¼	1 ¼	[d] ⅜	⅜
4 ½	1 ½	½	1 ¼	1 ¼	[d] ½	½
*5	*1 ½	*½	*1 ½	*1 ¼	*[d] ⅜	*⅜
*5	*1 ½	*½	*1 ½	*1 ¼	*[d] ½	*½
5	2	½	1 ½	1 ¼	[d] ½	½
*6	*1 ½	*½	*1 ½	*1 ¼	*[d] ⅜	*½
6	1 ½	½	1 ½	1 ¼	[d] ½	½
6	2	⅝	1 ½	1 ¼	[d] ½	½

[d]These sizes can be furnished with standard Y-face.





TYPE 12: STANDARD SIZES[a]—BONDS: VITRIFIED, SILICATE, RESINOID, AND SHELLAC

D	T	H			E	J and K	U	A
		Minimum	Maximum	Recommended				
1 ½	⅜	¼	⅜	¼	3/16	⅝	1/16	⅛
2	½	¼	½	⅜	5/16	1	1/16	⅛
2 ½	½	¼	⅝	½	5/16	1 ¼	1/16	⅛
3	½	⅜	¾	½	5/16	1 ½	1/16	⅛
3 ½	½	⅜	¾	½	5/16	1 ¾	3/32	3/16
4	½	⅜	1 ¼	1 ¼	5/16	2	3/32	3/16
4 ½	½	½	1 ¼	1 ¼	5/16	2 ¼	⅛	¼
5	½	½	1 ¼	1 ¼	5/16	2 ½	⅛	¼
6	½	½	1 ½	1 ¼	5/16	3	⅛	⅜
*6	*¾	*½	*1 ½	*1 ¼	*⅜	*3	*⅛	*⅜
7	½	½	1 ½	1 ¼	5/16	3 ½	⅛	7/16
7	¾	½	1 ½	1 ¼	7/16	3 ½	⅛	7/16
*8	*¾	*¾	*1 ½	*1 ¼	*½	*4	*⅛	*½
8	1	¾	1 ½	1 ¼	½	4	⅛	½

[a]Recommendations for new machine design indicated by asterisk.
[b]For sizes up to and including 2½ in. in diameter: Vitrified and silicate bonds only.
For sizes 3 in. in diameter and larger: All bonds—vitrified, silicate, resinoid rubber, and shellac.
[c]May be made thicker where required to provide adequate strength.
*These sizes can be furnished with standard Z-face.

TYPE 11: STANDARD SIZES[a]—BONDS AS INDICATED[b]

D	T	H			W	E[c]	J	K
		Minimum	Maximum	Recommended				
¾	¾	⅛	3/16	⅛	⅛	3/16	½	5/16
1	1	3/16	5/16	¼	⅛	¼	¾	½
1 ½	1	3/16	⅜	¼	3/16	¼	1 ¼	¾
2	1 ¼	¼	½	⅜	¼	5/16	1 ½	1
2 ½	1 ½	⅜	⅝	½	* ¼	⅜	1 ¾	1
*3	*1 ¼	*½	*¾	*⅝	** ¼	*⅜	*2 ¼	*1 ⅛
*3 ½	*1 ½	*½	*1 ¼	*1 ¼	** ¼	*⅜	*2 ¾	*2 ¼
*4	*1 ½	*½	*1 ½	*1 ¼	** ¼	*½	*3	*2 ⅝
*4 ½	*2	*½	*1 ½	*1 ¼	** ¼	*½	*3 ¾	*3 ⅛
*5	*1 ¾	*½	*1 ½	*1 ¼	** ¼	*½	*3 ¾	*3 ⅛
6	2	⅝	1 ½	1 ¼	* ⅜	½	4 ½	3 ¾
7	2	¾	1 ½	1 ¼	* ¾	½	5	3 ¾

Close TO EVERYTHING INDUSTRIAL

WYCKOFF

COLD FINISHED STEEL

CHICAGO

PITTSBURGH

PUTNAM, CONN.

NEWARK, N. J.

SAME PRECISION QUALITY FROM *FOUR* CONVENIENT SOURCES!

Close to you in the New England, Middle Atlantic or Mid-Western states, Wyckoff's *four* complete plants provide prompt, nearby service on precision cold finished steel. Wyckoff steels have set an enviable quality standard in finish, accuracy and uniformity . . . obtainable from all four Wyckoff plants. When you need cold finished steel bars (carbon or alloy), shapes, wide flats or shafting . . . look to the WYCKOFF plant near you for prompt, intelligent service. *You'll find service that saves . . . quality that pays!* Our service will be patterned to meet your requirements.

WYCKOFF STEEL CO.

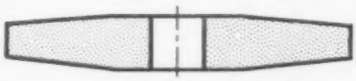
First National Bank Building, Pittsburgh 30, Pa.
3200 S. Kedzie Avenue, Chicago 23, Illinois
Works at: Ambridge, Pa.; Chicago, Ill.; Putnam, Conn.; Newark, N. J.
Manufacturers of Carbon and Alloy Steels—Turned and Polished Shafting—Turned and Ground Shafting—Wide Flats up to 12" x 2"

Use Classification for Grinding Wheels

SOURCE: SIMPLIFIED PRACTICE RECOMMENDATION

Type 1.—*Straight wheel*

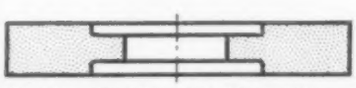
Type 2.—*Cylinder wheel*



Type 4.—*Wheel, tapered two sides*

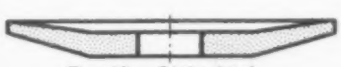
Type 5.—*Wheel, recessed one side*

Type 6.—*Straight cup wheel*

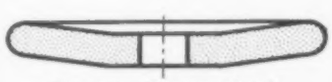


Type 7.—*Wheel, recessed two sides*

Type 11.—*Flaring cup wheel*



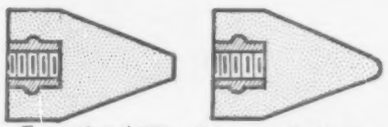
Type 12.—*Dish wheel*



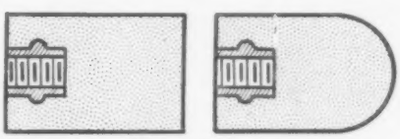
Type 13.—*Saucer wheel*

Type 16.—*Cone curved side*

Types 17 and 17R.—*Cones, straight side, square tip and round tip*

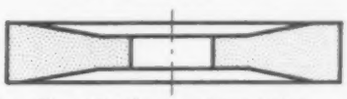


Types 19 and 19R.—*Plugs, conical end, square tip and round tip*

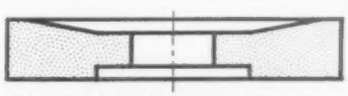


Types 18 and 18R.—*Plugs, square end and round end*

Type 20.—*Wheel, relieved one side*



Type 21.—*Wheel relieved two sides*



Type 22. *Wheel, relieved one side, recessed other side*

Important revisions in the above Recommendation include tables of sizes for the various wheels available and preferred sizes. Copies can be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., for 15 cents.

INDEX TO USE CLASSIFICATION

BASIC USES	SHAPE TYPE NUMBERS
CUTTING OFF	1
CYLINDRICAL GRINDING—	
Between centers	1, 5, 7, 20, 21, 22
Centerless (grinding and regulating)	1, 5, 7
INTERNAL GRINDING[1]	1, 5
OFFHAND GRINDING ON PERIPHERY OF WHEEL	1
SAW GUMMING	1, 13
SNAGGING (including billet grinding)—	
Floor Stand—	
Wheel speed 6500 SFPM and lower[2]	1, 4
Wheel speed over 6500 SFPM[2]	1
Portable—	
Wheel speed 6500 SFPM and lower[1] [2]	1, 5, 6, 11, 16, 17, 17R, 18, 18R, 19, 19R.
Wheel speed over 6500 SFPM [1] [2]	1, 5, 6, 11, 16, 17, 17R, 18, 18R, 19, 19R.
Swing frame—	
Wheel speed 6500 SFPM and lower[2]	1
Wheel speed over 6500 SFPM[2]	1
SURFACE GRINDING (precision, not including side, face, or disk grinding)[3].	
Horizontal spindle machines	1, 5, 7
Vertical spindle machines	2, 6
TOOL GRINDING—	
Broaches, cutters, mills, reamers, taps, etc	1 6, 11, 12
Offhand (lathe and planer tools, etc.)	1

[1] Mounted wheels and points not included. See current Grinding Wheel Manufacturers Association booklet "Mounted Wheels and Points."
[2] See Current American Standard Safety Code B-7, Abrasive Wheels, for permissible limits. (SFPM stands for surface feet per minute.)
[3] Segments not included. See current Grinding Wheel Manufacturers Association booklet "Specifications of Segments Used in Chucks."

Sure, those numbers show a one-sided preference for Oakite cleaning materials. But they also prove that Oakite materials are always effective when the going is toughest—on the job! That's why 6 out of 9 leading makers of engine starters insist on Oakite materials in their dip, spray or electrolytic cleaning operations.

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*rated AAAA in Thomas' Register

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MATERIALS
METHODS
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Specialized Industrial Cleaning

American Machinist REFERENCE BOOK SHEET

Gear Measurement Over Non-Standard Pins

BY EDWARD J. RANTSCH

If standard pins are not available for checking gears during cutting or inspection, pins of other sizes may be used if the diameter difference is not too great. The method is shown by these calculations:

Suppose a 16-tooth gear of 8 D.P. and 14½° pressure angle is involved (Fig. 1). In the accompanying table the standard-pin size is listed as 0.2188 in. (actually 0.21875 in.) for a gear of 8 D.P. And for a 16-tooth gear, the constant for measurement over pins is given as 18.469. Divide this value by 8 to get M equals 2.3086 in. (Fig. 2).

If non-standard pins are used, the value of M changes. Before the new value of M can be calculated, it is necessary to find the values of C in Fig. 2 and C' in Fig. 3.

Fig. 2 shows the case for standard pins. Here C equals one-half the pin diameter, or A, divided by sin 14½°, or 0.109375 ÷ 0.25038 = 0.4368 in.

Fig. 3 illustrates the method of finding M' if non-standard pins of 0.225 in. are used. Here $A = 0.1125$. Then $C' = 0.1125 \div 0.25038 = 0.4493$. And the difference between C' and $C = 0.4493 - 0.4368 = 0.0125$. This applies to one-half the gear only and must be doubled when finding M'. Thus M' equals M plus twice 0.0125 plus the difference in pin diameters, or

$M' = 2.3806 + 0.025 + 0.00625 = 2.3398$ in.

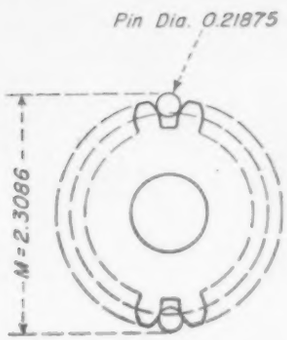

FIG. 1

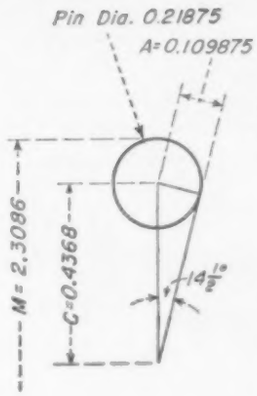

FIG. 2

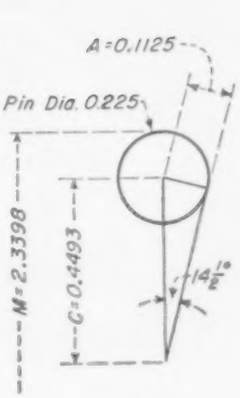

FIG. 3

Constants for Micrometer Readings Over Pins for Spur Gears of 14½ & 20° Pressure Angle

Diametral Pitch	Pin Diameter	Measurement Over Pins, Even Teeth			Measurement Over Pins, Odd Teeth		
		Number Teeth	Pressure Angles		Number Teeth	Pressure Angles	
			14½°	20°		14½°	20°
1	1.750	10	12.415	12.413	11	13.307	13.303
2	0.875	12	14.436	14.428	13	15.346	15.335
3	0.5833	14	16.455	16.440	15	17.376	17.359
4	0.4375	16	18.469	18.450	17	19.400	19.378
5	0.350	18	20.482	20.458	19	21.420	21.394
6	0.2917	20	22.493	22.465	21	23.437	23.407
7	0.250	22	24.502	24.471	23	25.452	25.418
8	0.2188	24	26.511	26.476	25	27.464	27.428
9	0.1944	26	28.519	28.480	27	29.475	29.436
10	0.175	28	30.526	30.484	29	31.485	31.443
11	0.1591	30	32.532	32.488	31	33.494	33.449
12	0.1458	32	34.538	34.591	33	35.502	35.454
14	0.125	34	36.543	36.494	35	37.509	37.459
16	0.1094	36	38.548	38.497	37	39.516	39.463
18	0.0972	38	40.552	40.499	39	41.522	41.467
20	0.0875	40	42.556	42.501	41	43.527	43.471
22	0.0795	42	44.560	44.503	43	45.533	45.475
24	0.0729	46	48.566	48.508	47	49.541	49.480
26	0.0673	52	54.576	54.512	53	55.553	55.487
28	0.0625	62	64.586	64.518	63	65.566	65.495
30	0.0583	72	74.596	74.521	73	75.580	75.504
32	0.0547	86	88.603	88.523	87	89.590	89.511
34	0.0515	102	104.613	104.529	103	105.602	105.517
36	0.0486	122	124.619	124.532	123	125.610	125.521
38	0.046	142	144.627	144.535	143	145.618	145.526
40	0.0437	160	162.627	162.535	161	163.618	163.526
44	0.0398	180	182.627	182.535	181	183.618	183.526
48	0.0365	200	202.627	202.535	201	203.618	203.526

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where to get it

Simonds Abrasive Distributors in all principal industrial centers of the U. S. and in many foreign countries carry stocks and can advise on grinding wheel selection. Write today for informative Bulletin ESA-154 on Snagging Wheels and Red Streak Flanges. Also for name of distributor nearest to you.

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NEWS OF METALWORKING

Improved Materials Handling Urged At Exposition to Boost Production

CLEVELAND — Improved handling of materials to increase production and to produce better working conditions was called for at the second annual National Materials Handling Exposition and Conference at the Public Auditorium here Jan. 12-16.

Attracting more than 15,000 plant executives and management officers, the exposition occupied three times the amount of space as in 1947, with more than 200 exhibitors showing products.

Where in 1947 the majority of exhibits were on powered and hand trucks, this year they ranged all the way from engineering services for management to giant unloading cranes and small-sized chain hoists.

The materials handling and management sections of the American Society of Mechanical Engineers met Jan. 13-14.

Sales Opportunity Noted

During the first four days of the conference leading authorities on materials handling presented their views, with Earl Bunting, chairman of the board of the National Association of Manufacturers and president of O'Sullivan Rubber Co., Winchester, Va., holding the spotlight with his address at the annual banquet of Association members on Jan. 14. Others who spoke were:

Ezra W. Clark, consultant, Battle Creek, Mich., asserted that salesmen in the Materials Handling field "have a wonderful opportunity of introducing into hungry plants the methods that will enable these organizations to increase the volume of production."

D. H. Burton, engineer, Bakelite Corp., discussed Standardization of Materials Handling Equipment. Other papers presented included: Integrating the Use of Different Types of Materials Handling Equipment by R. L. Franning, engineer, International Harvester Co.; Handling Unusual Shapes by Robert C. Brady, engineer, Ingersoll Steel Division, Borg-Warner Corp.; "The Plant Materials Handling Engineer—Value Duties and Authority" by O. E. Johnson of the Kaiser-Frazer Corp.; "Procedures for Making a Materials Handling Survey" by A. E. Aukens, consulting engineer, and "Materials Handling Factors in Plant Layout" by W. R. Postlewaite, engineer of the Standard Oil Co., of California.

Practically every field of industry was covered in one of the 31 motion picture films, produced by 23 companies, shown during the week in the special theatre within the exposition hall, all dealing with materials handling problems.

New, Novel Loader

Among the attention-getters at the Exposition as novel and new devices was the automatic pallet loader shown for the first time by the Production Aids, Inc., North Hollywood, Calif. Termed the "missing link" between the end of the conveyor line and the pallet, the loader takes cases or cartons direct from the conveyor line, after they have been sealed, and loads them onto the empty pallets, cross-tying them, to make a complete pallet load. Cases or cartons may come to the loader at any speed since the loader is automatic.

A loading ramp, to bridge the space between loading dock and car or truck has been designed with handles so that it can be easily and safely operated by a fork-truck operator was introduced by the Elizabeth Iron Works of Elizabeth, N. J.

Shown for the first time was a powered hand truck, product of Comet Mfg. Co., Minneapolis, Minn. Claimed to have all the versatility of a hand truck and all the advantages of a power truck, the truck will carry 1500-lb. loads on short steep inclines and up to 2,000 lbs. on level hauls.

Powell Pressed Steel Co., Hubbard, Ohio, exhibited its new drop-bottom production box, equipped with hopper and tray and slanted bottom.

Adjustable Truck Racks

Brummeler Steel Products Corp., Grand Rapids, Mich., utilized an old and widely used idea in turning out a commercial product in fitting one of its steel trucks with adjustable racks, such racks fitted with pegs upon which gears, etc., can be suspended when transported from one section of a plant to another. Not only are the racks adjustable, they are also so engineered as to form the base for shelves should the truck be wanted for that purpose.

Latest Methods of materials handling as shown at the recent National Materials Handling Exposition are exemplified in this picture of a portion of the exhibit in the Cleveland Public Auditorium which featured products of more than 200 exhibitors

Lead, Copper, Aluminum Seen Next To Fall Under "Voluntary" Control

WASHINGTON—Lying in the half-light between present governmental "wartime controls" (tin and antimony) and the coming industry-government voluntary allocations program (steel) are several metals that have not been mentioned in the talks on controls over industrial shortages.

The first metal slated to come out of the background when the present noise over iron and steel subsides is lead. Dropped from the wartime controls system by the Commerce Department last summer, the metal has been heading for the "critically short" category ever since. The deficit between demand and supply in 1948 is expected to approximate 200,000 tons.

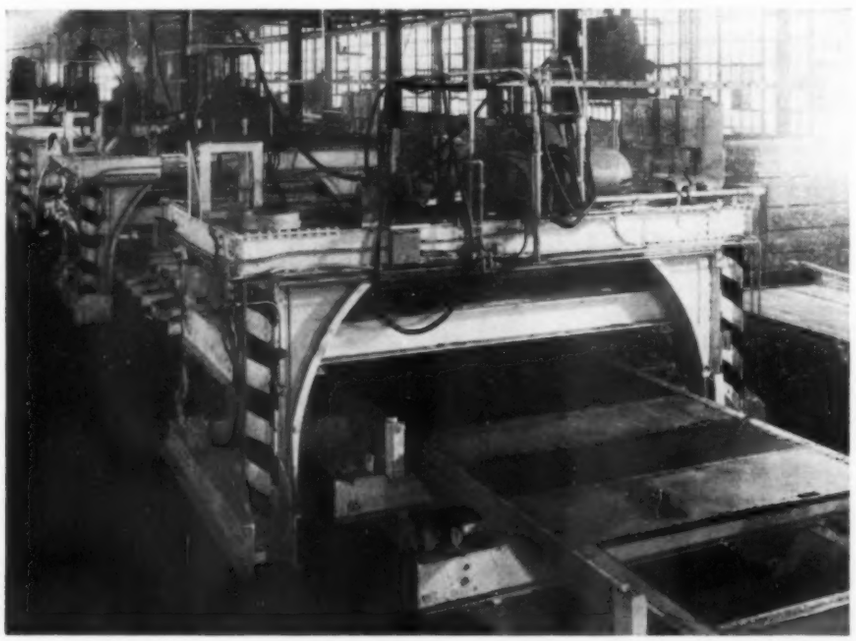
Since the Office of Materials Distribution, successor to CPA, probably will not ask that lead be pulled back under direct governmental control, the problem will be placed before the Harriman voluntary-control group for a workout like that now being given steel. Any controls worked out will concern only soft lead and soft lead scrap. There is enough antimonial lead scrap around to supply that market.

Either aluminum or copper should follow the heavier metal into conference rooms. Aluminum pig and sheet will be about 20% short of demand this year, according to estimates based on present demand. Any new demand for the metal will add just that much more to the deficiency. At present it is estimated that the shortage will amount to about 350 million pounds. Here, too, any control effort would be directed along the "voluntary" line.

Domestic demand for copper in 1948 is now estimated at 1,200,000 tons. Domestic production should total about 850,000 tons. Imports, which last year totaled 350,000 tons, normally would make up the difference between demand and domestic production. This year, however, with a Marshall Plan cutting down on U. S. imports of the metal, the balance will not be achieved. Best estimates now are that for the year the country will be short some 200,000 tons—about 20%. This will also be a job for the industry-government allocators.

Stamping Book Available

CLEVELAND—The fourth edition of the Blue Book of Stamping, issued by the Pressed Metal Institute, is now available on request to designers and users of stampings. It contains a listing of members, information regarding their facilities and facts about the Institute.



Mass Production Methods—American Car & Foundry has just completed at its Chicago plant a 24-per-day (potential) freight-car line, in which underframe, sides, roof and ends are subassembled in fixtures. Here are the three cross gantries which carry automatic units to submerged-arc weld car-side vertical seams. Two others weld longitudinal seams simultaneously. Jigs have pneumatic clamps and lift devices, as well as rotating elements for all down-hand welding.

The complete story will appear in American Machinist for Feb. 12

D. E. Van Deusen Named CTMA Head

DETROIT—D. E. Van Deusen, president and general manager of Kelly Reamer Co., Cleveland, was elected president of the Cutting Tool Manufacturers' Association at the fourth annual meeting recently.

Emil Gairing, president of Gairing Tool Co., Detroit, was named vice president. Reelected were: treasurer, R. H. Wolfe, president of Arrow Tool & Reamer Co., and Harry J. Merrick, executive secretary.

Named to serve for three years on the board were: Norman Lawton, works manager, Star Cutter Co., J. I. Schultz, vice president, National Broach & Machine Co.; R. G. Michell, president, Eclipse Counterbore Co., and W. G. Robbins, president, Carboloy Co., Inc., all of Detroit.

E. J. Kaiser, manager of the Davis Boring Tool Division, Giddings & Lewis Machine Tool Co., Fond-du-Lac, Wis., and Gordon Birgbauer, president Super Tool Co., Detroit, were elected to the board to fill vacancies.

Plastics Group to Meet In Atlantic City May 20

ATLANTIC CITY, N. J.—The Society of the Plastics Industry will meet here at the Ambassador Hotel May 20-21, William T. Cruse, executive vice president announced recently.

The Third National Plastics Exposition has been scheduled for Sept. 27 to Oct. 2 at the Grand Central Palace, New York City.

The society has available now a 451-page Handbook containing standard information and the best practices of the plastics industry. The Handbook has been in preparation four years and has been praised by the Armed Forces.

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Gaging Business

American Machinist Index of Metalworking Production

(1939 equals 100)

December	November	December Year Ago
226	223	217

(Note: the index is based on manhours worked)

Metalworking Hits New High

Metalworking production in the United States soared to a peacetime peak in December, according to the AMERICAN MACHINIST INDEX OF METALWORKING PRODUCTION. The index stood at 226, compared with 223 in November, and was nine points higher than in December, 1946.

▸ A year ago, in January, the Index was at 216 (1939 equals 100). It rose to 222 in March, after which a decline occurred to the year's low of 206 in July and August. In September the Index was back up to 216 and has been rising steadily since.

Machinery & Auto Groups Active

The improvement in metalworking production is principally in the machinery classification and in the automobile industry. The figures in the component groups comprising the AMERICAN MACHINIST INDEX prove this fact. The machinery group in December stood at 247, against 244 the previous month and 231 during December, 1946. The automotive group was up five points in December to 232; that is a gain of 18 points in a year.

Electrical Machinery Holds Firm

Electrical machinery has not been showing any gains, having moved mostly on a plateau the past year. The index figure in December was 245, up one point from November, but the same as in the corresponding month in '46. Lack of materials has been mainly responsible for inability to push higher.

▸ Transportation equipment group (excluding automotive units) spurted eight points in December. Even so, the index is nine points below a year ago. Railway car building is the chief support in this group. Aircraft and shipbuilding continue to pull down the total by their poor production performance.

Steel No. 1 Headache

Shortage of steel still is the No. 1 headache of the metalworking industries. While the situation is likely to be reasonably tight all year the worst period is the next few months.

▸ Reluctance of mills to ship into certain unfavorable freight-rate areas is playing hob with the steel supply of many users. Insufficient steel makes it necessary for many consumers, who are tooled up for production runs, to stop operations before the runs are completed. This is a costly process.

Aluminum Outlook Not Bright

The outlook in aluminum, too, is not good. By contrast with the surplus which loomed early in 1946, the situation today foreshadows a considerable shortage this year. The result is that producers still are refusing to book new orders. Chief trouble is the amount of electrical power available, rather than lack of manufacturing facilities.

▸ In other nonferrous materials, the forecast is not favorable. Tin is in brisk demand; brass mills are operating on heavier schedules.

Big Outlay for New Equipment

There is good news for metalworking in the latest Department of Commerce survey of proposed expenditures for new plant and equipment. All of U.S. business plans to spend $4.1 billion during the first quarter of 1948, or almost $1 billion more than in the same quarter a year ago. Though the anticipated outlays are down from the final quarter of last year, the decline is only seasonal. Much plant and equipment expenditure falls in metalworking.

Distributors Very Busy

Machine tool distributors report a rush of business during December, many of them having done the biggest volume of the year then. The number of orders closed since Jan. 1 has been fairly good too, but bookings have been spotty. Inquiries continue heavy.

▸ While the outlook for machine tool sales is favorable, builders are troubled by rising costs and by the pressing need for further price advances.

Export Business Is Puzzle

Foreign volume continues to puzzle the machine tool industry. There is a terrific backlog of orders for U.S. machines in such countries as France, but dollars are not at hand to close the deals. The Marshall program provides no direct relief for this situation, as no funds will be earmarked for production equipment such as machine tools. The governments involved will be left with the problem of finding somewhere the money needed to buy machine tools. Without machine tools, which are the basis of manufacture of all metal products, Europe's industrial economy cannot be rehabilitated.

Holland and Belgium Place Orders

The Netherlands and Belguim have provided some good machine tool business lately. Much potential exists in Sweden, but funds are at hand to pay for only a small proportion of it.

▸ Some builders look to Canada as a live source of orders. The Canadian government is insisting upon concentration within its borders of much parts manufacture, particularly automotive, formerly done in the United States and shipped to Canadian plants. If this pressure persists, some of the increased metalworking capacity in Canada will be secured by installation of U.S. machines.

Tool and Die People Cautious

Tool and die manufacturers are looking at the situation realistically, being fairly well divided between optimism and extreme caution. The year 1947 was slightly ahead of 1946 in billings. Backlogs have not fluctuated much recently, output about matching incoming business. Direct labor manhours worked have been less recently than in the early fall because of fewer working days.

Main Components of American Machinist Index

	December	November	December Year Ago
Machinery	247	244	231
Electrical Machinery	245	244	245
Autos and Trucks	232	227	214
Transportation Equipment	301	293	310
Other Metalworking	155	154	150

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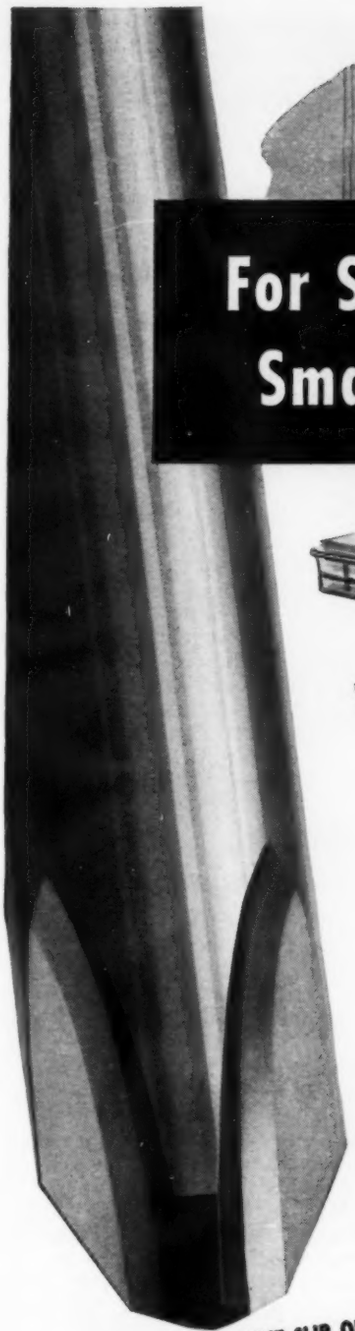


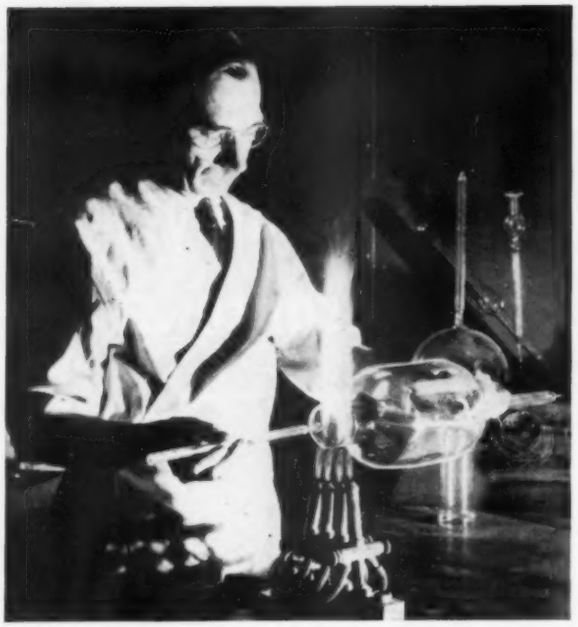
4-WINGED DRIVER CAN'T SLIP OUT OF PHILLIPS TAPERED RECESS

AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

Flask of Future, in which microfilmed documents and rare metals will be preserved until the year 2004, is shown being fashioned at the Westinghouse Lamp Research Laboratories, Bloomfield, N. J. Two of the flasks, custom-made to withstand extreme temperature changes, were placed in the cornerstone crypt in the five-story addition the Advertising Club of New York is building. The cornerstone will be reopened on the 100th anniversary of the club's founding



Positive Action on Allocation of Steel Anticipated Under OIC

WASHINGTON—Confused government-industry discussions of the "whys and wherefors" of steel shortages and allocations may soon settle down to some positive action.

Initially there were these problems.

Steel industry's fear of Justice Department action if companies cooperate too far;

Small manufacturers' fears for survival;

A Senate committee recommendation that the steel industry be investigated;

Sundry proposals of Henry J. Kaiser and the efforts of various industries to insure themselves a fair share in the ultimate distribution of steel.

Shades of the War Production Board can be seen around the office of John C. Virden, wartime head of WPB in Cleveland, and recently appointed in charge of the new Office of Industry Cooperation. Through this organization Virden will run Commerce's end of the Republican voluntary anti-inflation program. He plans to use "a great deal of WPB experience and know-how." An example is his proposed committee of top-level advisors of four or five men, consisting of one representative from labor and the balance from industry, including steel.

At the opening session of OIC, Kaiser presented a plan which he calls a voluntary plan for the fair allocation of steel to curb inflation and expand production. It provides for public hearings on all claims of individual companies for steel allocations, providing, as well, for the right of appeal. His plan suggests that the steel industry create and finance a steel anti-inflation commission to be composed of five to nine outstanding persons of proven experience. His suggested membership ranges from Bernard Baruch to Eric Johnson.

Meanwhile, large steelmakers, through Benjamin F. Fairless of U.S. Steel, have asked for written assurance that they will not be liable under anti-trust laws if they combine to allocate steel. John Ford Baecher, of the anti-trust division of the Justice Department, has promised steel officials that adequate assurances will be forthcoming.

The Senate Committee, headed by Pennsylvania's Ed Martin, which has been studying the steel situation for nearly a year, has recommended that FTC investigate alleged distributional discrimination, withdrawal from traditional markets, and the purchase of small steel plants. The committee does, however, accept industry's contention that little can be gained through plant expansion.

Admiral Sworn In

WASHINGTON—Rear Admiral Paul L. Mather, USN, has been sworn in as associate administrator of the War Assets Administration, succeeding Jess Larson, who was recently appointed administrator.

Machine Tools Study Topic of Electrical Unit

PITTSBURGH—Electrical engineering in regards to machine tools was discussed at one of the conference sessions of the American Institute of Electrical Engineers' winter meeting here Jan. 26-30.

Papers presented included:

Electrical Engineering in Machine Tool Industry, by W. B. Wigton, electrical engineer, Cincinnati Planer Co.

Electric Drives for Planers, J. W. Harper, Industrial Engineering Divisions, General Electric Co.

New Types of Adjustable Speed Motors for Machine Tools, W. M. Elder, electrical engineer, Westinghouse Electric Corp.

Electrical Features and Performance Analysis of an Automatic Hob and Relief Cutter Sharpener, R. E. Johnson and Frank A. Glasso, electrical engineers, Barber-Colman Co.

Packaging Exposition In Cleveland April 26

CLEVELAND—The 17th annual Packaging Exposition of the American Management Association will open April 26 at the Public Auditorium and continue through the 30th.

Developments in packaging, packing and shipping machinery, equipment, materials, design and services used in the manufacture and sale of virtually every product in the nation's commerce will be displayed by approximately 200 exhibitors.

The annual three-day AMA Conference on Packaging, Packing and Shipping will also be held in the Auditorium April 27-29 concurrent with the exposition. Management aspects of materials, methods, procedures and merchandising will be discussed by packaging executives, engineers and technical experts.

Flynn To Head CIO Drive At Allis-Chalmers Mfg. Co.

WASHINGTON—CIO President Philip Murray appointed a veteran organizer of the Steel Workers Union, Timothy Flynn, to direct the reorganization of the United Auto Workers, Local 248, at Allis-Chalmers Mfg. Co., West Allis, Wis., as the Federal District Court, Washington, prepared to try Harold R. Christoffel, honorary president of the local, on charges of perjury last March before the House Labor Committee. Part of the program calls for waiving initiation and reinstatement fees for 90 days.

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Detroit

AUTO OUTPUT STABILIZED AT 100,000 MONTHLY...TOOL, DIE SHOPS ACTIVE...FORD ORDERS PLACED IN DEEP SOUTH, WEST

There is an air of equilibrium about Detroit today. Automobile production has been fairly stabilized above 100,000 units a week. Tool and die shops have been working steadily, between 40 and 48 hours a week, on a fairly constant load of orders.

Engineering departments have largely settled down to working out details of programs on the boards before them; developing of the broad outlines has long since been completed.

So far as the machinery community is concerned, nothing portentous is in immediate sight. A good share of the requirements for the various 1949 Chrysler programs has already been let out and some sizeable lots are now being placed. In this latter category are numerous specially-designed machines, for specific models, indicating designs are now finalized and therefore can be expected before the end of this year—but not much before.

$60-Million Changeover Cost

In all, Chrysler expects to spend some $60-million on this forthcoming changeover. The company figures that its tooling costs today run two to three times those of prewar, so this probably is equal to about a $25-million retooling job in the days of old. The result, from all indications, will be a line of definitely advanced automobiles.

The current models of this company, incidentally, have been quietly but notably changed from their 1947 predecessors. Installation of new lower pressure tires necessitated a number of under-the-hood changes —widened rims, revamped braking and steering systems.

From Lansing comes word that Olds engineers are at a point on their "V" engine which might permit release of tooling before too long. This engine, like parallels in the rest of General Motors, is intended for higher compression ratios than now prevail, and for that reason its release may not be as rapid as engineering progress would indicate. As time goes on and fuel demands continue to mount, the day of higher octane ratings at every corner gasoline pump seems to retreat.

Within the General Motors family, Buick's new automatic transmission, which already has accounted for some tooling business, will account for more. As it stands, the device is usable only on the senior series of Buick's three lines, and not in much volume at that. Machines are on order, for early delivery, which will increase the volume in that one size.

Test load of 630 tons is lifted by world's largest overhead travelling crane, undergoing final tests at San Francisco Naval Shipyard at Hunters Point—125% of crane's normal capacity. Facility, which cost $2.5 million, took three years to build, is actually twin cranes, which may operate in tandem or separately. From concrete deck to generators atop carriage crane measures 208 ft. Carriage of each crane rides along 730 ft. rail runway, 182 ft. above regunning mole. Since cranes can run on cantilever arms 162½ ft. out over water on either side of mole or pier, two ships can be serviced simultaneouly

As soon as this production is heightened, Buick will make further releases of tooling for transmissions to fit the other two lines.

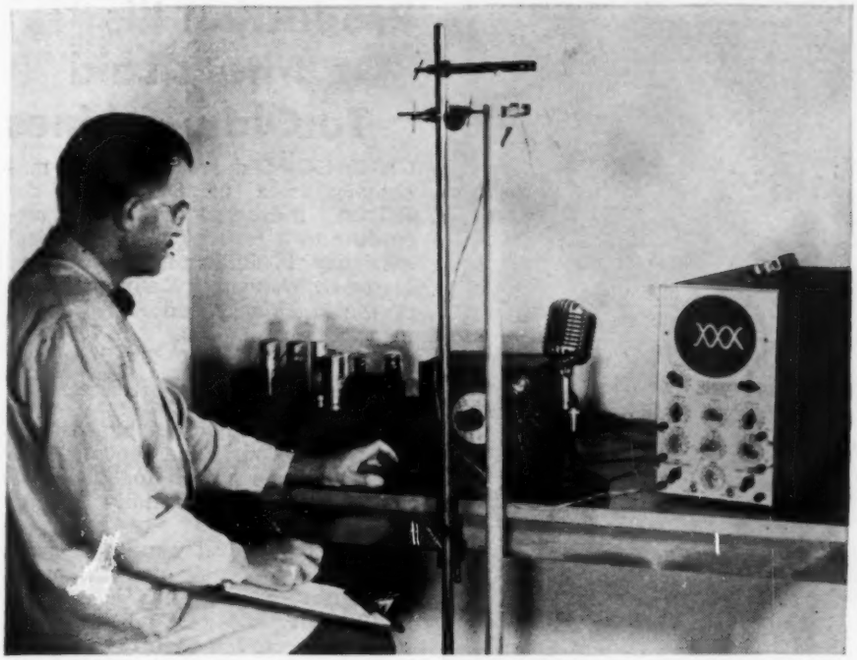
Buick, like everyone else, finds fairly ready availability of standard machine tools, but has had a hard time getting delivery on the specials. It might be noted that this is true in gaging instruments and controls, for machine tools and for regular production requirements. There are plenty of standard types at hand, but the complicated "specials" are not immediately around.

Rather desultory progress of Ford Motor Co., in uncovering new supply sources on the West Coast and in the deep South moved a small step ahead in January with completion of three California deals. Cannon Electric Development Co., Los Angeles, will produce $1-million in die castings and is setting up facilities to produce $400,000 worth of horns. Bendix Aviation Corp., North Hollywood, will supply $400,000 in brake cylinders. R. H. Osbrink Mfg. Co., Los Angeles, will supply $100,-000 in aluminum castings for camshaft timing gears.

Ford hopes that a year or two of education of would-be vendors on such matters as small profit margins and volume production will enable them to care for the requirements of nearby regional plants much more fully than today.

If this program works out it will have one aspect of real significance for tooling shops. It will mean that additional sets of tools will have to be supplied for such parts as are farmed out to additional vendors.

(*Advertisement*)



Laboratory set-up for measuring tone of chime tubes. Lissajous figure on screen of cathode ray oscilloscope is being used to determine the frequency (cycles per second) of the chime's fundamental note.

Revere Tubes make Good Music

BECAUSE of the importance of the market for brass tube used in door chimes, Revere some time ago embarked upon a complete scientific study of the musical qualities of such tube, to determine the factors responsible for pleasing tone. Here is a brief report of the work, which offers an example of the thoroughness with which Revere attacks problems concerning the application of its mill products.

The first step was purely experimental. We proceeded by ear. Over 100 samples of tubes in various alloys, tempers and gauges were hung up, struck, listened to, and preferences obtained from many people. These tests indicated not only what was the best alloy, but also what were the proper temper and wall thickness requirements to produce the most acceptable and desirable tone. But Revere did not stop there. It was desirable to know what made that tone preferable, what were the factors that influenced it, and how they could be controlled. It was felt that only with such complete information in hand could Revere be in position to control chime tube quality accurately, and fill customers' orders reliably with a standard product.

The project then was turned over to a laboratory physicist who is also a talented musician. Here began the most ambitious and lengthy and scientific part of the work, employing the most modern electronic apparatus, including a beat-frequency oscillator and a cathode ray oscilloscope. These made it possible to dissect the tone produced, measuring the frequency and intensity of the fundamental note and its partials with an accuracy of one cycle per second. Much new information was uncovered. For example, the strike tone so clearly heard when the chime is struck does not actually exist in the tube, but is a difference tone between the 1st and 3rd partials. Hence, for good tone, those partials must be equal in intensity and duration.

It requires seven closely-typed pages just to sum up the work in general terms; the laboratory records fill a large volume. The net of it is that Revere really knows about all there is to know about chime tube, scientifically, musically, physically, and, of course, how to produce it. If you need such tube, come to Revere.

Perhaps you use brass tube not for its sound, but for its corrosion resistance, strength, machinability, the polish it takes, the ease with which it can be bent, soldered, brazed, plated. Revere also knows how to control the factors influencing such applications, so come to Revere for brass tube for any purpose.

Revere also makes other types of tube, including copper water tube, condenser tube in such alloys as Admiralty, Muntz, cupro-nickel, tube in aluminum and magnesium alloys, lockseam tube in copper alloys and steel, and electric welded steel tube. Many of these can be had not only round, but also square, rectangular, oval, and in various flutings and special shapes. The Revere tube line therefore is complete, and awaits your orders.

The Technical Advisory Service will gladly collaborate with you in such matters as selection of alloys, tempers and gauges, and in fabrication processes.

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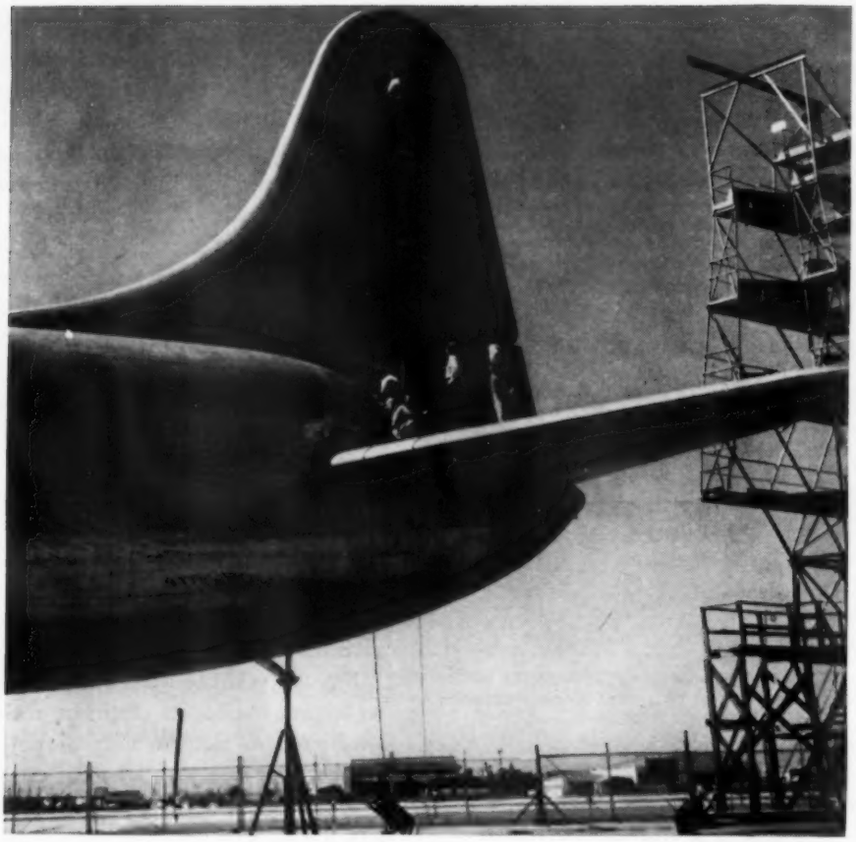

Block and Tackle is used to inspect 57-ft. tail fin of Consolidated Vultee Aircraft's XC-99, world's largest land plane, since no hydraulic stand used for conventional airplanes can be elevated that high. Convair engineers rigged up a boatswain's chair on end of block and tackle and hoisted block in place by means of pulley built into fin. That makes inspector self-propelled for checking tail surfaces of six-engined, double-decked plane. To pull tackle through pulley, light cable stretches from pulley to attaching point inside fuselage. Lead weight recessed in outer surface of fin is attached to cable. Cable is tied to light line inside fuselage. Inspector releases cable from attaching point so that lead weight pulls cable over pulley down to stabilizer. There, inspector attaches block and tackle, hauls cable with block and tackle tied to it back into fin

WAA to Seek Bids on Tools

WASHINGTON—Field offices of the War Assets Administration have been instructed to begin competitive bid offerings at various locations as soon as tools are screened for the national stockpile and are adequately offered at fixed prices.

No new large offerings of surplus machine tools have been made by WAA since Oct. 1, 1947, although some sales programmed before that date have been continued. The halt on new offerings was called to allow the Joint Army and Navy Machine Tool Committee to screen and tag tools wanted for the reserve.

JANMAT selections from all storage locations will not be completed for some months, but under WAA's latest instructions, sales will be conducted immediately after the completion of tagging.

After JANMAT selections at a specific location, a 45-day inspection period will be provided to accommodate all classes of prospective buyers. Priority purchasers may buy individual items at fixed prices during the first 15 days of the inspection period. During the last 30 days, unsold tools will be offered at fixed prices to all buyers and, at the same time, bids will be accepted, but awards on bids will not be made until after the 45-day period.

Any residual stocks after fixed-price and competitive-bid sales, where quantities are large enough, will be offered in car-load lots to all classes of bidders.

As of Dec. 1, 1947, about $1 billion worth of surplus machine tools out of acquisitions of about $1.32 billion had been sold to commercial users, donated to institutions or returned to the stockpile.

Production Ills Of Britain Laid To Old Machines

CHICAGO—Old and worn out machinery is a primary cause for Britain's industrial breakdown, according to a report on technological efficiency in England, recently released by William J. Kelly, president of the Machinery and Allied Products Institute.

A comparison of 25 industries showed that in all cases the output per worker in the U.S. was greater than in England, often by a factor of three or four. The report warns that the basic causes for this high inefficiency are potentially present in the U.S.

The textile industry suffers heavily from a lack of new and automatic machinery, according to Mr. Kelly. In 1946 only 0.8% of English carding machines were less than 10 years old. Not more than 5% in the U.S. Nearly a quarter of the worsted spindles and many of the looms predate 1900, the report continues. Only 8% of the looms in England are automatic. Most of the sewing machines in use in clothing factories are 30 to 40 years old, and the lace-making industry has not installed any new machinery since 1923.

Mechanized per-man-hour shoe production in America exceeds that of England by 102%. The British iron and steel worker makes only one-quarter of the amount of the American. Thirteen farmers in the U.S. using a potato harvester perform the task of 40 British hand pickers.

Commenting on mechanization, Mr. Kelly said: "The low rate of mechanization in British industries has led in some cases to a vicious circle. The equipment producers, restricted to a starvation diet, are unable to spend money on research and development, hence their product stagnates. This stagnation in turn appears to justify their customers in holding on to their old machines, thus confirming the dearth of demand."

Shepard Elected EITA President

NEW YORK—F. J. Shepard, Jr., treasurer of Lewis-Shepard Products, Inc., Watertown, Mass., was elected president of the Electrical Industrial Truck Association at the annual meeting here recently.

Other officers elected were: W. Van C. Brandt, Electric Storage Battery Co., Philadelphia, vice president, and Charles F. Kells, New York City, secretary-treasurer.

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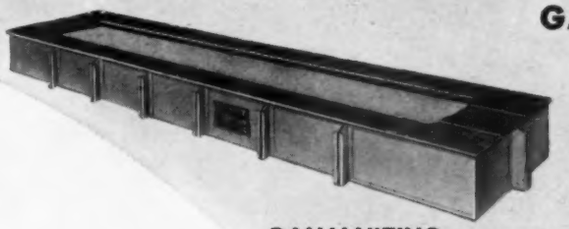

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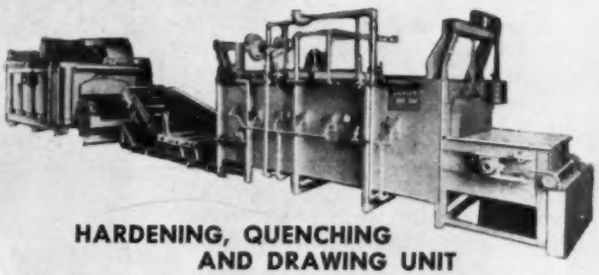

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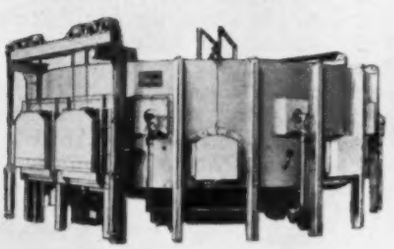
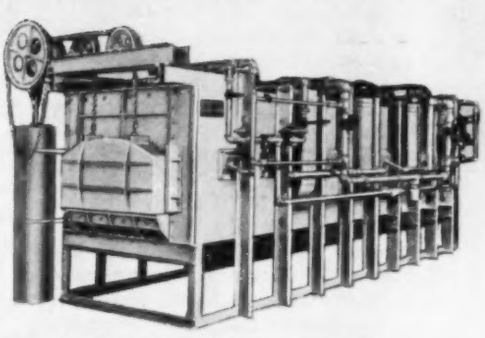
As a division of Sunbeam Corporation we have the opportunity of working with our furnaces in the production of Sunbeam appliances, lawn sprinklers, sheep shears, animal clippers, etc. In manufacturing our own products we must contend with practically every heat treating problem faced by industry —a position unique in the furnace manufacturing field.

This experience with our own furnaces in large volume production enables us to render a service to you far beyond other manufacturers. That is one reason why Sunbeam Stewart Furnace installations have been so successful. They are based not only on furnace engineering ability, but on practical experience under actual operating conditions. We have learned through actual experience the factors that give longest furnace life . . . greatest production . . . best quality . . . and lowest operating cost.

Our highly trained technical staff of furnace engineers who for over 50 years have built furnaces for the leading companies throughout the United States and abroad are qualified to recommend the correct type of furnace to meet your requirements.



ROTARY HEARTH FORGE



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A letter, wire or 'phone call will promptly bring you information and details on Sunbeam Stewart Furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a Sunbeam Stewart engineer will be glad to call and discuss your heat treating problem.

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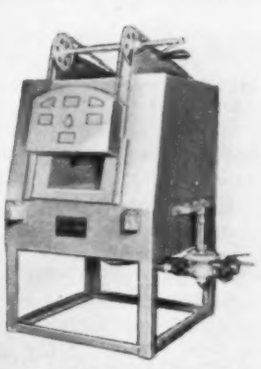

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Industry Given Chance To Help On Mobilization

WASHINGTON—The job of readying American industry for any future war production has been dropped in industry's lap by the man who is responsible for overall coordination of the national security program.

Tossing the gauntlet to industry is businessman Arthur M. Hill, chairman of the recently created National Security Resources Board. Hill conferred recently with 15 industrial executives who were prominent in the resources mobilization for World War II.

By inviting industry to come in and help work out the basic problems leading up to utilization of American know-how, Hill started work on the actual "industrial mobilization plan" for the next war, one which "divvies up" the American production pie. The Munitions Board of the Military Establishment has about ready for release an "Industrial Mobilization Plan" which actually is a design for the administrative framework of one part of the national defense program.

Only four questions were put before the industrialists for study:

1. What should be the scope and content of the NSRB's resources mobilization program?

Implications of the responsibilities of the board under the National Security Act of 1947 (which created NSRB) are extremely broad, and it is essential, thinks Hill, "that our program be sufficiently comprehensive to cover the total task of mobilizing our entire national resources and keeping them in a state of preparedenss to meet any future emergency."

2. Upon what assumptions should the board base its planning? What phases of the overall program of the board should be given priority?

These questions, according to the board chairman, will be in part answered by the National Security Council, the Joint Chiefs of Staff, and the entire National Military Establishment. There are, however, many other basic principles and assumptions in the industrial, economic and civilian fields which must be considered in planning for mobilization. Example — what is the minimum reasonable period for mobilization under an all-out effort? As a general policy, would it be better to impose all-out controls at the beginning of mobilization or to impose controls gradually as the need becomes acute?

3. To what extent, and how, can individual firms—and specific industries—prepare themselves for mobilization? How can such planning be related to the overall planning of the Board? This is the most important question of the four—to industry—at present.

As an important side issue of this question, Hill asks industry "what arrangements can be made now with industrial concerns for the loan, for a limited period, of key men to assist the board in accomplishing its work?

4. How can the Board best utilize the government's departments and agencies to further its work in coordinating industrial, military and civilian resources mobilization?

"Enjoined by its creating act to utilize to the maximum extent possible the various governmental agencies, the board is in a position for the first time in the history of our country to bring about an awareness on the part of private enterprise and the government itself of the need to engage continuously in activity that will contribute to the national security," Hill stated.

Lightest Diesel Engine is now in production at the Standard Machine Works, Pasadena, Calif. One of these engines has powered a 30-foot fishing boat for the past five years at a cost of five cents per hour. One of the features is the elimination of vibration at high speed—18,200 rpm. A decompression release eases hand cranking and standard gear housings allow a selection of starting power. J. M. Gilmore, president, describes the engine which has basic measurements of 37 inches overall, height of 20¾ inches and weight of 607 pounds. It produces 15 hp.

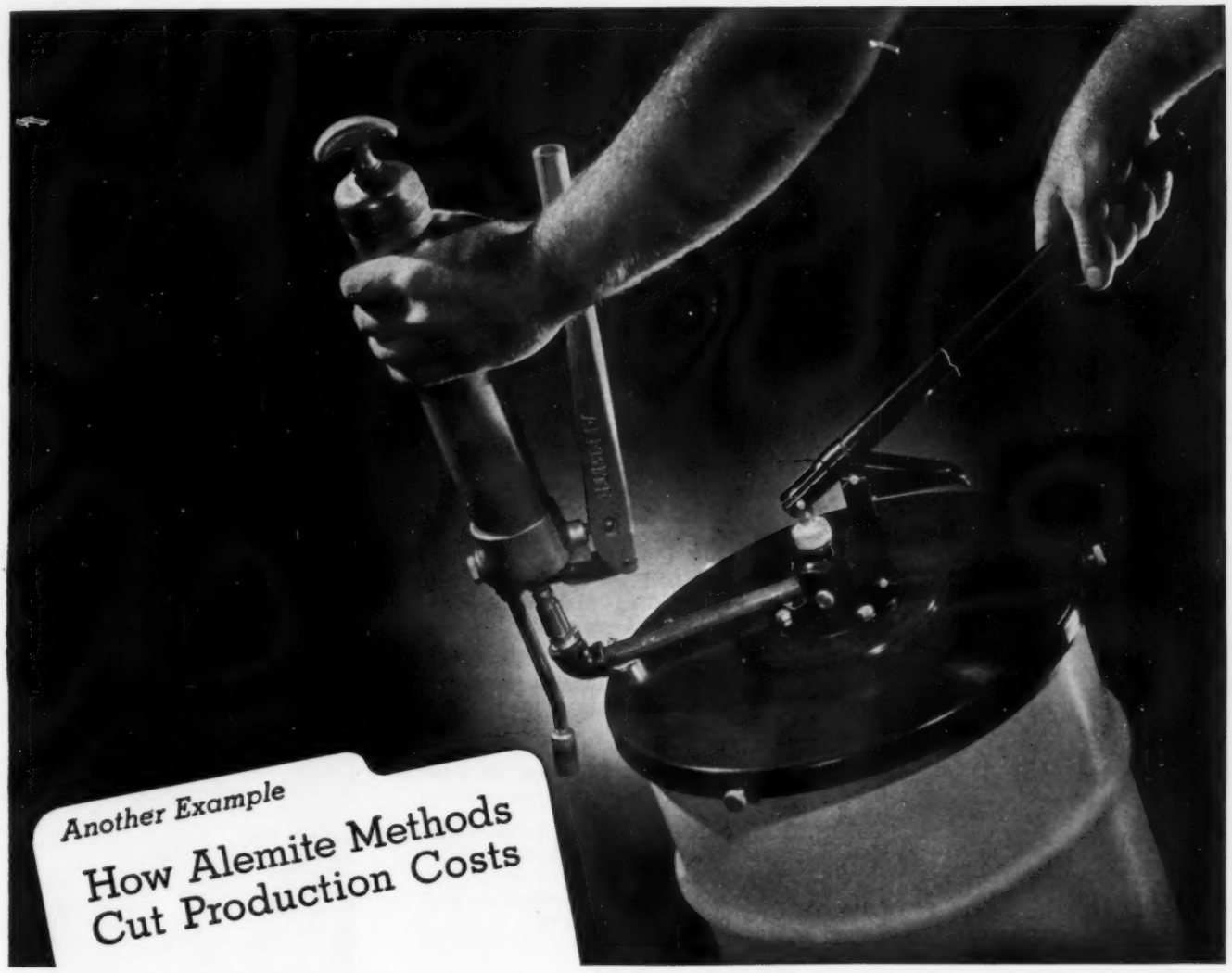
Goss & DeLeeuw Marks Founding

KENSINGTON, CONN.—Expanded from a small, abandoned plant to one of the most modern factories in the nation, Goss & DeLeeuw Machine Co., has entered its 26th year of manufacturing automatic chucking machines.

Under the guiding hand of Stanley T. Goss, president, the concern was organized in 1922, with Mr. Goss, Adolph L. DeLeeuw and John S. Black as the incorporators and directors.

Mr. Goss knew what was needed in the way of an automatic chucker and it was Mr. DeLeeuw who designed the machine. These two men worked as a team until Mr. LeLeeuw died in 1942.

In celebration of the company's 25th anniversary, a special, bound book was printed explaining the history and background of the concern.



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Your Lubrication Methods May Be More Antiquated Than You Suspect

A simple thing like using the hand and paddle method to fill a grease gun boosts maintenance costs . . . and that means lower productive capacity per dollar per machine. The Alemite Representative is a *specialist* in modern methods of handling and applying lubricants. A five minute conference with him may open your eyes to new cost-cutting ideas. So, contact your Alemite jobber, or write Alemite, 1899 Diversey Parkway, Chicago 14, Illinois.

You use hand guns in your plant. Then listen to this. Alemite's new method of loading a hand gun can save up to 3¾ manhours for every 100 lbs. of grease you use! Three and three-quarters hours you can apply to other much needed preventive maintenance work.

A minor operation yes, but it's such savings that help to augment your drive to cut production costs. In addition, this Alemite Method saves grease and eliminates mess . . . keeps dirt and moisture out of lubricants.

It's just one of many ways that Alemite Methods simplify lubrication procedures and add more productive time to machines. The Alemite Representative can show you case after case where time study analysis proves that modern Alemite Methods eliminate costly, time-consuming handling of oils and greases . . . slash time-outs for lubrication . . . completely mechanize barrel-to-bearing lubrication. He can show you how to lubricate as many as 300 bearings from *one* safe, central point while the machine keeps on producing! Get the complete facts, today!

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MODERN LUBRICATION METHODS THAT CUT PRODUCTION COSTS

Names in the News

C. H. Williams

C. H. Williams has been appointed chief engineer of Carnegie-Illinois Steel Corp., Pittsburgh. He has been with U.S. Steel since 1927 in numerous positions.

J. Harry Marshall has been elected vice president of the Nicholson File Co., Providence, R. I., succeeding the late Augustus E. Saunders. Mr. Marshall joined the firm in 1918. Elected a member of the board in 1943, he will continue as assistant general manager.

Paul S. Strecker

Paul S. Strecker has been named assistant to the president of E. W. Bliss Co., Detroit, and will handle special administrative assignments.

William T. Kelly, Jr., has been elected first vice president of the American Brakeblok Div. of American Brake Shoe Co. In addition to his new duties, he will continue as president of the Kellogg and Engineered Castings Divisions.

James P. Beyser has been promoted to works manager of the Buflovak Equipment Div., Blaw Knox Co., Buffalo, while **Martin J. Kermer** has been named consulting engineer and **Albert W. Eckstrom,** chief corporation engineer.

L. B. McKnight, former executive assistant to the president, has been elected vice president of the Chain Belt Co., Milwaukee, Wis., in charge of the Conveyor and Process Equipment and Construction Machinery Divisions. **B. F. Devine,** manager of the Construction Machinery Division, has also been elected a vice president.

Stanley L. Willis, former vice president and general manager of The Standard Tube Co., Detroit, has been appointed president of the firm succeeding **T. F. Thornton,** who has retired.

F. B. Adams, Jr., has been elected president and director of Wilson Welder & Metals Co., Inc., New York. He succeeds **Thomas B. Hasler,** who has been named chairman of the board following the resignation of **C. E. Adams.**

Thomas A. Kennally, vice president in charge of sales, has been appointed vice president and assistant to the president of Philco Corp. to assist in the overall direction of the corporation's activities. **Joseph H. Gillies,** vice president in charge of radio production since 1942, has been appointed vice president in charge of Radio Division Operations of Philco.

Peter F. Hurst, previously executive vice president and general manager of Aeroquip Corp., Jackson, Mich., has been elected president of the firm which he was instrumental in organizing in 1940.

Maurice W. Reid has been appointed manager of the General Electric Company's Bridgeport, Conn. works.

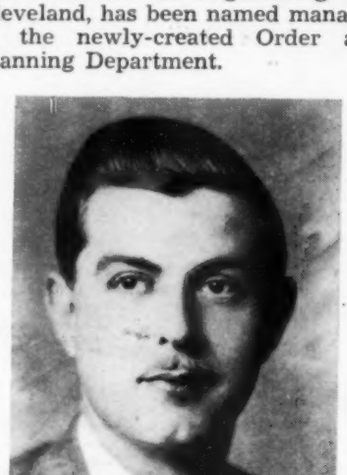
Alvin Haas has joined the Hanchett Manufacturing Co., Big Rapids, Mich., as vice president and general manager. For the past 17 years he has been president and general manager of Yates-American, Beloit, Wis.

Paul H. Maurer, former executive engineer of Redmond Co., Inc., Owosso, Mich., has returned to the company after a three-year absence to assume the newly-created post of director of engineering.

Donald W. Douglas, Jr., has been appointed director of contract requirements for Douglas Aircraft Co., Inc., succeeding **Karl P. Grube,** resigned.

C. A. Jurgensen has been appointed acting works manager of the De Laval Steam Turbine Co., Trenton, N. J. Also, **W. A. Reynolds,** manager of the IMO rotary pump division of DeLaval, has been named manager of the company's newly-combined IMO pump and worm gear divisions.

Clifford C. Tippit, formerly a methods supervisor with the Reliance Electric & Engineering Co., Cleveland, has been named manager of the newly-created Order and Planning Department.



Harry H. Rose

Harry H. Rose has been named general sales manager of the Simmons Fastener Corp., Albany, N. Y. For the past three years he has been a sales engineer for the firm and prior to that was an engineer for the Simmons Machine Tool Corp., parent company of Simmons Fastener.

Abraham Rubin has been appointed general manager of the Apex Smelting Co., Cleveland plant. **Robert Beck** has been named eastern sales manager, while **Walter Bonsack** is director of the laboratories and research.

W. A. Harrington has been named manager of the San Pedro, Calif., yard of Bethlehem Steel Company's shipbuilding division.

G. E. Tenney has been appointed service manager of The Lincoln Electric Company's newly-expanded Service Department.

David E. Postle has been named domestic sales manager of Bell Aircraft Corporation's Helicopter Div. He has been with the Civil Aeronautics Board for the past five years.

How the First All-Steel Welded Vise is Made

By H. F. Seymour, President
Columbian Vise & Manufacturing Co.
Cleveland 4, Ohio

WHAT is believed to be the first all-steel vise fabricated by arc welding is the Columbian Work Shop Vise shown in Fig. 1. This vise was redesigned in collaboration with Parsons Engineering Corp., welding specialists, from conventional construction to arc welded steel to achieve superior strength, accuracy and long life.

Basic material used is SAE 1020 hot rolled steel plate, punched and formed to the proper shapes. Fig. 2 shows the component parts. The base plate is 3/8" thick,

Fig. 2. Component parts of the vise.

the nose piece 5/16" and all others 3/16".

The first fabricating operation is the welding of the front, or sliding, half. The rail, T-blank, front body and jaw are assembled in a jig and tack-welded. In

Fig. 3. Welding front body to rail with inside fillets.

this same jig the front body is welded to the rail with inside fillets (see Fig. 3), and the nose piece tacked on.

This front half is then passed to the

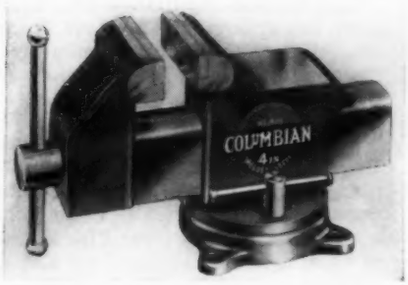


Fig. 1. The Columbian all-steel welded vise.

next welder, who makes the final fillets which join the nose piece and T-blank to the front body. The next operator welds the jaw to the nose piece.

Meanwhile, the rear half of the vise is being assembled in similar manner by another bank of welders. The rear body and swivel base are assembled in a jig and tacked together by the first man. The next man welds these parts with continuous fillets.

The front half and the partially-assembled rear half of the vise are then passed to a welder who fits them together. He inserts the sleeve, or inside guide, in the rear body, slides the rail of the front half through it, and welds the sleeve to the rear body with four 1-inch welds. Fig. 4 shows how the assembly is clamped in the jig. He then tack-welds on the rear anvil.

The vise then goes to the last welding operator, who welds the rear jaw to the anvil and the anvil to the rear body.

The vise assemblies are passed from one operator to the next by means of steel chutes.

Air hammers are used to peen the welds and clean off the spatter, and the welds are then ground smooth. Hardened steel jaw faces are drilled and counter sunk into the jaws. The screw and handle are forged steel and the malleable iron nut is replaceable.

AWS Type E-6030 electrode is used for welding the rear body to the base in

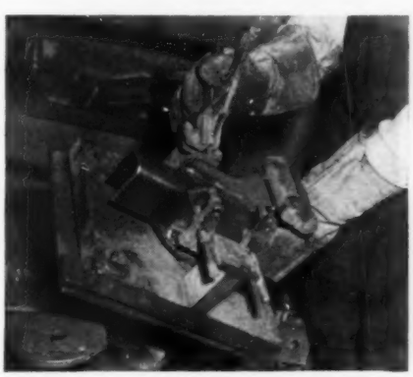


Fig. 4. Raising clamp which held inside sleeve for welding to rear body.

order to get a fillet with exceptionally deep penetration. For all other welds, E-6012 electrode is used.

With 12 set-up men and welders, 1,000 vises are produced a week. Production can be stepped up to 2,500 a week by increasing the force to 22 men.

Fig. 5. Making final welds—anvil to body, and jaw to anvil.

The above is published by LINCOLN ELECTRIC in the interests of progress. Machine Design Studies are available free to engineers. Write The Lincoln Electric Company, Dept. 31, Cleveland 1, Ohio.

F. E. Ericson, formerly vice president and general manager of the Barden Corp., Danbury, Conn., has been elected president.

Clyde W. Somerville, until recently executive vice president and manager, has been elected president of the Seattle Steel Co., Seattle. He succeeds the late **William Pigott.**

Albert E. Brodigan has been appointed regional representative in the Caribbean area for Borg-Warner International with headquarters in Mexico City.

John Morrow, Jr., vice president of purchasing and traffic, retired after more than 45 years with International Harvester Co., Chicago. **Harry O. Bercher** succeeds Mr. Morrow as director of purchasing and traffic, while retaining his position as general manager of the steel division.

BUSINESS ITEMS

Ohio Crankshaft Co., Cleveland, has acquired the **Induction Heating Division** of **The Budd Co.,** Detroit for its Tocco Division. The purchase includes equipment, machinery, inventories and patents but not the land or buildings. The Tocco Division has also added an Engineering Department to its Chicago office. **A. O. Wood** has been appointed district engineer.

The Air Reduction Co., New York, has formed a wholly-owned subsidiary, **Air Reduction Pacific Co.** The subsidiary will carry on all business formerly conducted by **Air Reduction Sales Co.** in western U.S. **H. P. Etter,** formerly sales manager of the Pacific Coast Division, is president and director of the new firm which is located at Room 1813, Mills Tower, 220 Bush St., San Francisco.

The J. I. Case Co., Chicago, has purchased the implement manufacturing plant, works in progress and materials on hand of the **Kilby Steel Co.,** Anniston, Ala.

Marco Manufacturing Co., which has been formed in Michigan as an outgrowth of the **Mardigan Corp.,** has acquired a manufacturing plant at 21930 Grosbeck Highway, East Detroit. Production of stampings and stamping assemblies for the automotive industry has just started, but the owners are planning to more than double the present plant area and productive capacity.

J. A. Wagner, Inc., has purchased the machine shop equipment from **Pump & Products Co.,** Cleveland, to manufacture general metal cutting machinery. Pump & Products will act as sales representatives for Wagner.

Kulka Steel & Equipment Co., Alliance, Ohio, has purchased the **Alliance Engineering Co.** for the development of a new industry.

The Parker Appliance Co., Cleveland, has appointed **The B. W. Rogers Co.,** Akron Ohio, as distributor of Parker industrial tube fittings and valves.

General Export and Importing Co., has opened a Los Angeles office for dealing in steel, machinery and construction materials. The office, a subsidiary of **General Pipe & Supply Co.,** will be managed by **Edward Belford** and **Irving Brownstein.**

Quality Industries, Inc., Cleveland, a former partnership known as **Quality Engineering Co.,** has been incorporated by **Vincent G. Pimser** and **Stephen W. Moller,** who will serve as president and vice president, respectively, of the firm.

Hobart Brothers Co., Troy, Ohio, has appointed **Pioneer Welding Equipment Co.,** Sioux City, Iowa, as distributor of the full Hobart line in portions of northwest Iowa, Northeast Nebraska, and southwest South Dakota.

The Geometric Tool Co., New Haven, Conn., has appointed the following distributors in Ohio: **The Scallan Supply Co.,** 2337-39 Gilbert Ave., Cincinnati and **The Ross-Willoughby Co.,** 269 W. Spring St., Columbus and P.O. Box 899, 1310 W. Main St., Springfield. These companies will carry a stock of standard Geometric threading tools and chasers.

The Milcor Steel Co., Milwaukee, Wis., a subsidiary of **Inland Steel Co.** has changed its name to **Inland Steel Products Co.**

Truck-Man, Inc., formerly a division of **Yard-Man, Inc.,** Jackson, Mich., has been incorporated as a separate unit for the manufacture of the Truck-Man Model D and Truck-Man Utility trucks. Yard-Man, Inc. is continuing as a manufacturer of lawn mowers exclusively. Officers of Truck-Man include **T. B. Funk,** president; **W. S. Butterfield,** secretary-treasurer; and **Walter Meyer,** general manager.

Armstrong Bros. Tool Co., Chicago, has moved to 5200-5300 W. Armstrong Ave.

Cincinnati Metalcrafts, Inc., has purchased the **Konrad Tool & Die Co.,** also of Cincinnati, which will continue to do precision tool and die work. New officers of Konrad include **C. L. Harrison,** president and **E. W. Harrison,** vice president.

OBITUARIES

James Coulter, 81, retired president and treasurer of the James Coulter Machine Co., Bridgeport, Conn., which he helped found 10 years ago, died Jan. 2. He also was the founder and vice president of the old Automatic Machine Co., Bridgeport, from 1900 to 1938.

Prescott R. Lovejoy, 45, president and general manager of The Lovejoy Tool Co., Inc., Springfield, Vt., died Dec. 24. After a short period with The Fellows Gear Shaper Co., he became associated with Lovejoy and was made its president in 1940.

James E. Morrow, 68, former vice president and general manager of the Willys Overland Automobile Co. and War Assets Administration official, died Jan. 13.

Allen F. Edwards, 71, one of the original members of Chrysler Corp. and president of the Universal Products Corp., Detroit, died Jan. 13.

Percy E. Collins, plant engineer of the New Departure Div., General Motors Corp., Meriden, Conn., died Jan. 11.

Arnold Stucki, 85, president of A. Stucki Co., Pittsburgh, died Jan. 12, following a long illness. An early designer of locomotives, steel freight and passenger cars, Mr. Stucki was associated with the Pressed Steel Car Co. and the Standard Steel Car Co., before organizing his own firm.

Charles W. Lawser, president and treasurer of The Wicaco Machine Corp., Philadelphia, died Dec. 17.

Harry L. Frevert, director of The Midvale Co., Philadelphia, died Dec. 11 after a short illness. He was president of the firm from 1931 to 1944.

Aubrey R. Davis, 43, manager of the Ford Motor Company's new assembly plant in East Los Angeles, was killed recently in an automobile accident.

Miller Peterson, 58, president of the Monarch Pattern & Foundry Co., Los Angeles, died recently.

MEETINGS

American Society of Tool Engineers. Sixth annual industrial exposition. Public Auditorium, Cleveland. March 15-19. J. M. Cannon, director of public relations, 1666 Penobscot Bldg., Detroit 26.

Pressed Metal Institute. Annual meeting. Hotel Statler, Buffalo. Feb. 10-11. Sam Morrison, vice president, Morrison Steel Products, Inc., Buffalo, chairman.

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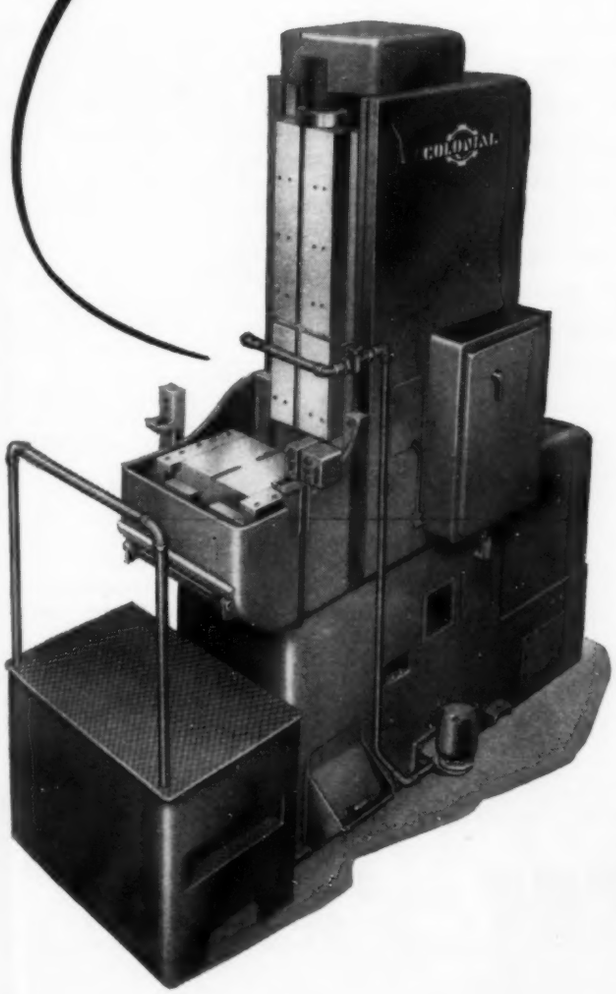

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Sale of Surplus Plants Realizes 43 p.c. of Cost

WASHINGTON — War Assets Administration, now reaching the bottom of the surplus plant barrel, has sold approximately 100 large war surplus plants and facilities during the last six months. Since sales of industrial properties began following the end of the war the administration has realized about a 43 per cent return on investment.

Through November $2,369,116,000 (acquisition cost) worth of industrial properties had been sold for $1,012,863,000.

The following is a partial list of dispositions during the past six months.

Aircraft Engine Plant, South Bend, Ind., sold to Studebaker Corp., for $3,592,000. To be used for manufacture of trucks and autos.

Portion of Wright Aeronautical Corp., plant, Lockland, O., sold to Electric Auto-iLte Co., for $8,400,000 Will produce auto parts and equipment.

Brass Strip Plant at Kenosha, Wis., sold to American Brass Co., for $948,070. Produces cold and hot rolled strip brass.

Steel Wire Finishing Plant, Dunkirk, N. Y., sold to Allegheny Ludlum Steel Corp., for $1,500,000. Used during war to produce bullet core, will be converted to production of stainless steel wire.

Metal Castings Plant, Boston, sold to General Alloys Co., for $38,000. To produce steel, aluminum and magnesium castings.

Facilities integrated into Campbell, Wyant and Canon Foundry Co., Muskegon, Mich., acquired by company for $696,666.67. To produce gray iron and steel castings.

Machine Tool Plant at Big Rapids, Mich., sold to Hanchett Manufacturing Co., for $95,955. Original cost $170,631.

Three portions of Evansville, Ind., Ordnance Plant, original cost $3,014,681, sold to five Evansville residents for $195,000. Used during war to produce small arms ammunition and incendiary bombs, to be used for canning food products.

One portion of West Virginia Ordnance Works, Point Pleasant, W. Va., sold Arthur N. Davidson and Robert W. Erdlitz of Hamilton, W. Va., for $27,000. Original cost $84,000. To produce furniture.

Second portion of W. Va. Ordnance Works, (Camp Conley), sold to I. D. Icard, Point Pleasant, for $15,600. To produce kitchen cabinets and sewing machine cabinets.

Shell-Casing Plant, Johnstown, Pa., sold to Bethlehem Steel Co., for $500,000. To be used for fabrication of railroad car frames, mine cars,

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HERE IT IS: a complete, detailed, step-by-step Manual covering all phases of the use of Carboloy Cemented Carbide in sheet-metal dies!

The best methods for designing, assembling, and finishing draw dies, blanking and forming dies and punches are outlined in the five sections of this *Die Engineering Manual.* It's thoroughly illustrated, too—with over 100 pictures and diagrams to help explain applications and operations.

Whether or not you are already using Carboloy Cemented Carbides in your shop, send for this Manual. It may lead you to new, profitable applications . . . or help you improve your designing, assembling or finishing methods.

Today's big trend is toward carbide dies. And here is information to help you lead the trend. Carboloy dies mean longer die life, fewer rejects, better finish, closer tolerances, lower costs. The *Carboloy Die Engineering Manual* contains much information that will be of real interest to you about this hardest metal made by man.

SECTION ONE, by way of introduction, gives a brief review of what Carboloy Cemented Carbide is and of its principal advantages to the die maker and user.

SECTION TWO shows typical applications of Carboloy Cemented Carbide sheet-metal dies and punches . . . a multitude of suggestions for cost-saving applications.

SECTION THREE is a basic outline of designing, assembling, and finishing methods for draw dies.

SECTION FOUR gives similar information on designing, assembling, and finishing blanking and forming dies, clearly treated and illustrated.

SECTION FIVE outlines designing and finishing methods for punches.

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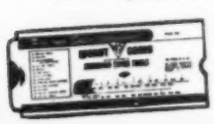

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road mats, long span steel joints, etc.

North section of Milwaukee Ordnance Plant sold to Joseph Schlitz Brewing Co., for $949,000. Plant, originally a chocolate factory, converted during war to small arms ammunition plant, will be utilized to expand company facilities.

Industrial portion of Des Moines (Iowa) Ordnance Plant, sold to Deere and Co., Moline, Ill., for $4,150,000. Used during war to produce small arms ammunition, the plant will produce primary parts, foundry, and assembly works.

Steel Foundry in Indian Orchard, Springfield, Mass., sold to Chapman Valve Manufacturing Co., for $916,-500. Will produce steel valves.

Gasoline Injector System Plant, at Chicopee, Mass., operated during war by American Bosch Corp. converted into voacation school. Sold to city of Chicopee for $61,500.

Service facilities built by government continuous to Lakey Foundry and Machine Co., Muskegon, Mich., sold to company for $88,952. Original cost, $284,503.

To be used as part of foundry which during war produced forgings for tank and truck engines.

Desk Machinery Manufacturing Plant at Bath, Maine, sold to Hyde Windlass Co., for $200,000. To be used for manufacture of special ship machinery and propellers.

Incomplete Plant No. 2 of Indiana Ordnance Works, Charlestown, Ind., sold to Neon Fluorescent Engineering Co., Louisville, Ky., for $75,234. Will produce Neon signs, transformers and cold-cathode lighting units. Intended during war for production of rocket propellants.

Canton Ohio Gun Forging Plant, sold to Ford Motor Co. for $950,000. Formerly producing 105-MM gun barrels, the plant will supply forgings for cars, trucks and tractors.

Two turbo-supercharger plants at Milwaukee operated during war by Allis Chalmers, sold to Hotpoint, which cost government $4,400,000, Inc. of Chicago for $2,122,000. Plants, will produce electric dish washers and hot water heaters.

Facilities of Crucible Steel Castings Co., Milwaukee, leased for 15-years, with option to buy, to trustee for concern. The property, which originally cost government $2,040,-151, is leased for a minimum of $48,-000 a year. The foundry, capable of producing 8,000 to 9,000 tons of light and medium steel castings per year, may be assigned to Crucible, now being operated by trusetee under voluntary bankruptcy proceedings and in process of reorganization.

Four aircraft forging plants, operated during war by Wyman-Gordon Co. in Worcester, Mass., sold to that company for $950,000. The plants are intermingled with privately-owned properties and cannot be operated independently.

Two artillery fuse lines at Arkansas Ordnance Plant, Jacksonville,

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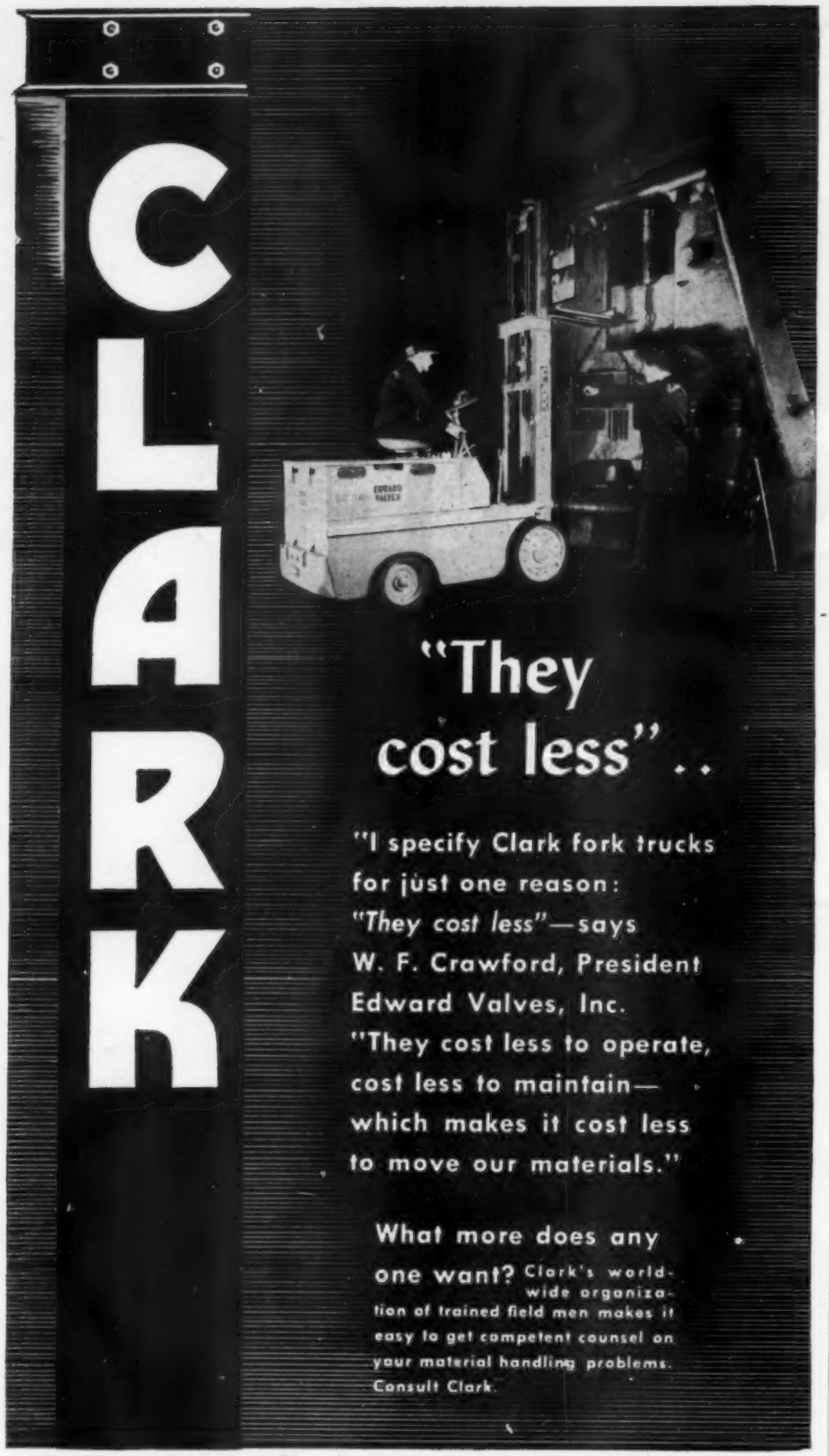
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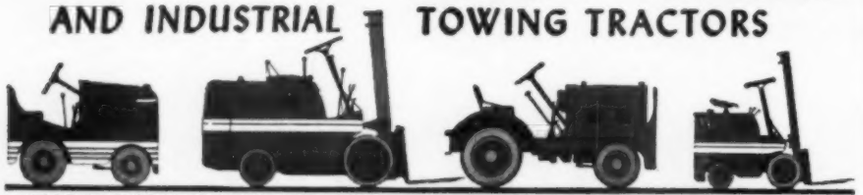


CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 3, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Ark., sold to Schott-Newcomb, Inc. of St. Louis for $200,000. One line will be used for manufacture of air conditioning equipment, the other for heating equipment. Total cost to government of two lines was $2,259,317.

Hartford (Conn.) Machine Gun and Parts Plant, operated during war by Colt's Patent Fire Arms Mfg. Co., sold to Standard Paper Co., Hartford, for $285,000. Property, which cost government $486,921, contains one structure 123 years old, two 81 years old, one 40 years old, and one six years old.

New River Ordnance Plant, Dublin, Va., sold to Burlington Mills Corp., Greensboro, N. C., for $615,000. The facility, used to manufacture ammunition bags, will be used for dyeing natural and synthetic fabrics.

Camp Gordon Johnston, Carrabelle, Fla., sold for $441,338 to Grier A. Quay and John Blosco of East Palestine, Ohio. Will be converted into a multiple operation unit including ceramics industries, production units for pressure tanks and furniture, and cold storage facilities for meat.

Radio tube plant near Fairmount, W. Va., sold to Samuel Sidle, Miami, Fla. for $500,000. Plant, originally costing government $1,675,370, will be cleared of machinery and used as a storehouse, distribution center and bakery.

Steel foundry in Omaha, Neb., sold to Omaha Steel Works for $225,000. Foundry, with capacity of 4,000 tons of castings per year, will be a pioneering venture by Works to develop new markets.

Engine lathe and boring lathe plant in Saginaw, Mich., sold to Wickes Boiler Co. for $110,000. Will produce heating boilers.

Welding rods plant at Pittsburg, Calif., sold to Fram Corp., East Providence, R. I., for $116,118. Will manufacture oil filters.

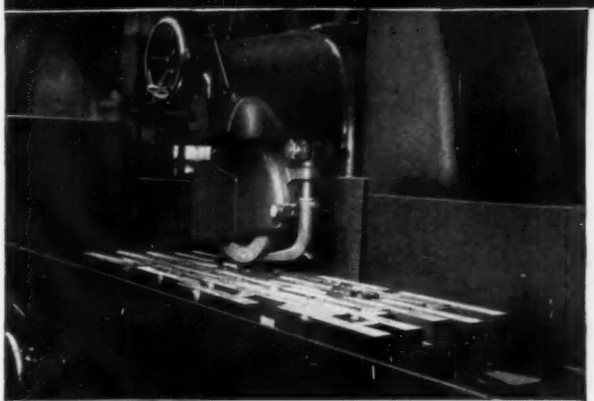
Plant at Cincinnati, Ohio, used during war for production of heavy-duty shears and presses, sold to Cincinnati Shaper Co., wartime operator, for $608,000. Will produce heavy metal working machines.

Steel foundry facilities, built by government to augment production of heavy steel castings at American Rolling Mill Co., Middletown, Ohio, sold to company for $125,000. Original cost to government of the facilities was $402,488.

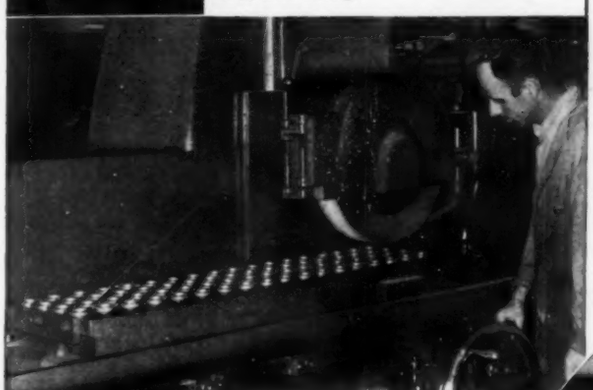
Bowling Green (Ky) Radio Tube Plant sold to General Electric Co., wartime operator, for $356,500. Plant, which cost government $1,061,461, will be converted to production of electric water coolers and mechanical refrigeration units.

Industrial installation at Stockton, Cal., sold to Hickenbotham Bros. Ltd. for $57,500. The plant, which cost government $151,587, was used during war by National Cylinder Gas Co. New use will be production of

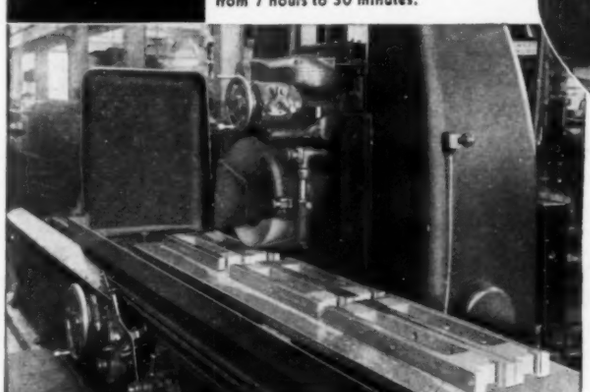
LARGE TABLE SPACE MEANS MORE PIECES PER LOAD AND GREATER PRODUCTION *with the Mattison Grinder*



● Cross Slide Draw Bars formerly ground 5 pieces at a time. Now ground on a Mattison Grinder 27 pieces per load. 50% time saving.



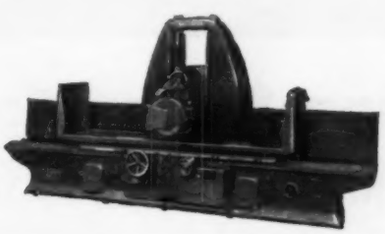
● Caps previously ground few at a time on small grinder. Now, Mattison Grinder handles 75 at a time. Time was reduced from 7 hours to 30 minutes.

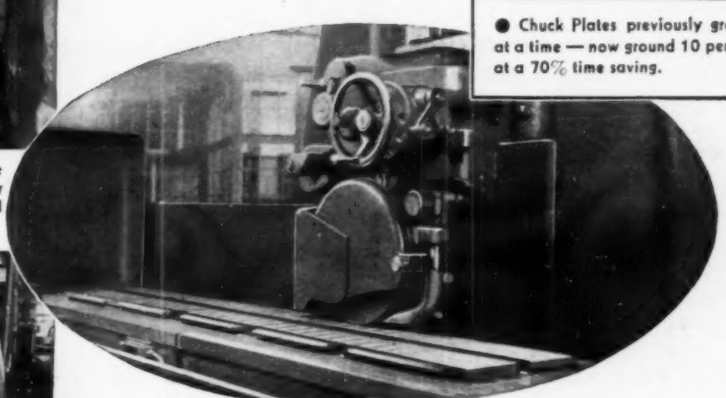


● Head Slide Guides formerly ground one at a time in 36 minutes — Now ground on a Mattison Grinder 9 pieces per set-up at a 77% time saving.

Examples: Grinding 75 pieces per load instead of 18 — cut time 80% . . . . . 10 pieces per load instead of 2 — cut time 70%, etc.

Jobs shown indicate the possibilities for increased production by handling large quantities per set-up. In your efforts to obtain maximum production and lower cost, it will pay you to check into the capabilities of the Mattison Grinder.



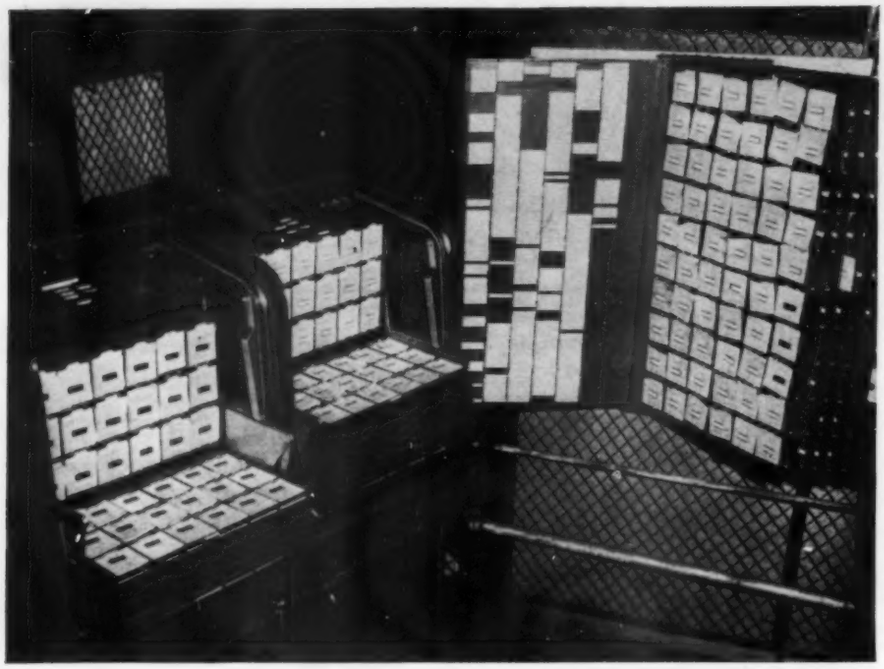


● Chuck Plates previously ground 1 at a time — now ground 10 per set-up at a 70% time saving.

ADDITIONAL INFORMATION

Also available is free Set-Up Book showing further examples of work ground on Mattison Grinders — Send for a copy today.

MATTISON MACHINE WORKS
ROCKFORD · ILLINOIS



Saving $15 by Spending $1 for McCASKEY TOOL CONTROL

Three manufacturers recently completed thorough studies of the savings to be made in their plants through the use of a modern tool checking system. The results amazed them!

One plant operates several tool cribs. Their engineers reported that an investment of about $5000 will save $73,000 the first year of operation. They recommended McCaskey Tool Crib Control.

The engineers of the second plant reported annual purchases of small tools and possible annual savings that opened the eyes of their management. They recommended McCaskey Tool Control for three cribs.

Savings of $65,000 on a tool investment of $500,000 were reported in the third plant. The engineers again recommended McCaskey Tool Crib Control to do the job.

Each of these plants has a world-wide reputation for alert production management. They have invested millions in modern production equipment but overlooked economies from adequate control of tools.

Facts from the results of numerous users prove that large savings can be made in practically every plant loaning tools to employees. They represent widely varying requirements . . . plants employing from as few as 50 or 75 to fifty thousand or more and operating one or many tool cribs.

Let us have a representative explain how McCaskey will pay its way from the beginning in your plant . . . or send you proof of savings in several well-known plants.

McCaskey INDUSTRIAL CONTROLS

PRODUCTION • INVENTORY • TOOLS • COSTS • PAYROLL

THE McCASKEY REGISTER COMPANY, ALLIANCE, OHIO

McCaskey Systems Ltd., Galt, Canada — The McCaskey Register Co., Watford, England

welding rods by Hickenbotham.

Large marine electrical equipment plant operated during war by Bendix Aviation Corp. at Norwood, Mass., sold to Tobe Deutschmann Corp. for $644,445. Will be used for manufacture of radio parts.

Maintenance area of Arkansas Ordnance Plant, Jacksonville, Ark., sold to Arkansas State Highway Dept. for $43,500. Will be used as a central highway shop.

Government-built electric and steam power plant at Pekin, Ill., sold to American Distilling Co. for $300,000. Will be used, as in war, in production of alcohol.

Steel forging facilities in Cudahy, Wis., sold to Ladish Co. for $2,200,000. Plant, which produced steel forgings for army bomber program, originally cost $10,416,877. The plant will be expanded to produce commercial automotive and farm machinery forgings.

Basic Materials Producers

Two blast furnaces and a by-product coke oven at Granite City, Ill., sold for $3,255,000 to Missouri-Illinois Furnaces, Inc., a subsidiary of Koppers Co., Inc., and Hanna Coal and Ore Corp. The plant, which originally cost the government $8,096,948, will continue to produce pig iron for foundries in the area. It has a capacity of 465,000 tons of pig iron annually.

Experimental Alumina Plant at Harleyville, S. C., sold to Giant Portland Cement Co., Philadelphia, for $666,815. Designed to produce 36,500,000 pounds of alumina annually, the plant is being converted to produce 800,000 tons of cement annually.

Incomplete blast furnace at Monessen, Pa. sold to Pittsburgh Steel Co. for $2,126,000. Buyer will complete construction of the furnace and hopes to begin pig iron production by May, 1948. Capacity is 450,000 tons a year.

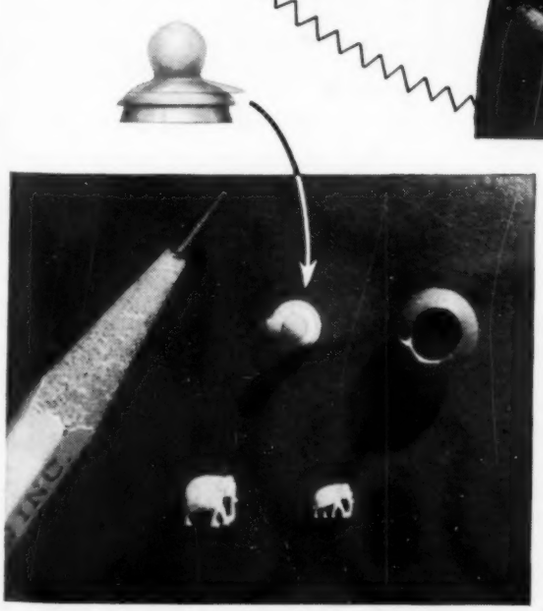
Portion of electric steel-ingot facilities at Middletown, O., sold to American Rolling Mill Co., war time operator, for $250,000. The buildings and facilities, which cost the government $423,314, were erected and used in conjunction with American's plant. The facilities will be utilized in new construction to produce electric furnace steel.

Ferrosilicon plant in Charleston, S. C., sold to Pittsburgh Metallurgical Co., Niagara Falls, N. Y., for $325,000. Will continue to produce ferrosilicons.

Iron ore sintering facilities intermingled with American Rolling Mill Co. at Hamilton, O., leased to that company for six years for $36,000 a year. Plant, which cost $777,278 produces iron ore sinter for charging blast furnaces and open hearths.

Incomplete charcoal and pig iron plant near Rusk, Texas, sold to McGrossin and Co. for $300,000. The plant, which cost the government $1,875,000, will be completed and

WOULD YOU HIRE THIS ZULU GIRL TO RUN A LATHE ?



Minute ivory elephant carvings with hollow bean and ivory cover. Pencil shows relative sizes.

Among the many trinkets gathered for his shop in Durban, South Africa, a well known curio dealer* came across miniature hand-carved ivory elephants, packed within a hollowed out bean and covered with a very small ivory lid. All had been hand-fashioned by native Zulu maidens.

With modern vision, this curio dealer thought the work of these girls could be speeded if the lid covering the hollow bean were turned on a lathe. His purchase of a 9-inch South Bend Lathe did the trick. Zulu girls have been trained as operators and the delicate job is now being done with fine South Bend precision.

South Bend Precision Lathes are known the world over. They are made with 9″, 10″, 13″, 14-1/2″, 16″, or 16/24″ swings.

* Name on request.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906

419 EAST MADISON STREET • • • SOUTH BEND 22, INDIANA

LUFKIN MICROMETER
DEPTH GAGE

ACCURATE

EASY TO USE

For easy, accurate depth measuring of finished holes, keyways, and slots, toolmakers prefer Lufkin Micrometer Depth Gages. Hardened and ground base, 3" or 5" long, sits firmly without rocking. Interchangeable rods for 0 to 3" measuring have hardened and lapped ends, and are equipped with adjusting nut to compensate for wear. Knurled surface at top of both sides of head assures firm grip. Exclusive!—only Lufkin Micrometer Depth Gages have patented lock nut that maintains reading. For free catalog write THE LUFKIN RULE CO., SAGINAW, MICH., New York City.

BUY THROUGH YOUR DISTRIBUTOR

LUFKIN FOR ACCURACY

used initially for production of foundry iron, later for manufacture of charcoal iron and by-products of wood distillation.

Iron mine and ore reduction plant developed in the last century by Andrew Carnegie, operated during World War II to increase national output of iron, sold to Peter M. Chamberlain, Jacksonville, Texas, for $170,000. Wartime purchase cost government $753,229. Although the mine and smelter produce concentrate at a ratio of one ton of concentrate to 15 tons of ore compared to the usual ratio of one to six, the new owner will use new operational methods and will be in production sometime in 1948.

Tin reclamation plant in Birmingham, Ala., operated by Southern Detinning Co. during war, sold to American Rock Wool Corp. for $120,000. The plant, designed to salvage tin and black iron scrap from tin cans, was built at a cost of $1,233,485. It will be used to produce rock wool insulation.

Steel facilities adjacent to the Monaca, Pa., plant of Superior Drawn Steel Co. sold to the company for $120,000. The facilities, built by government at a cost of $282,602, could not be operated independently, and will continue in operation as part of the mother plant.

Two magnesium facilities in Ludington, Mich., operated during the war by Dow Chemical Co. and Dow Magnesium Corp. sold to Dow Chemical for $3,300,000 the plants produce magnesium from brine wells.

A calcium tungstate plant, Salt Lake City, Utah, operated during war by U.S. Vanadium Corp. sold to Structural Steel and Forge Co. for $81,400. Plant will produce materials for housing and building industries. In the future the plant will be expanded for manufacture of steel products.

Shipyard Equipment

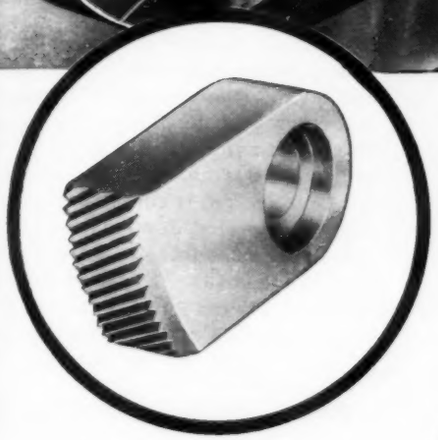
Five buildings and certain items of shipyard equipment at Maywood, Calif., sold to Consolidated Steel Corp. for $65,278. Original cost to the government was $205,302.

Certain portions of the Portsmouth Naval Shipyard at Somersworth, H. H. sold and leased to the General Electric Co. No figures as to prices have been released. General Electric has been authorized to resell a ten acre undeveloped tract to Pittman and Brown, contractors of Salem, Mass. This property will be used for homes for General Electric area employees.

Moore Dry Dock Co., West Yard, Oakland, Calif., sold to Graham Industries, Inc. of Oakland for $2,750,000. The facilities will be used for lumber and housing business, machine shop operations, low-bed truck manufacture, wrought iron manufacture, ship repair, and shipbreaking.

U. S. Naval storehouse at New

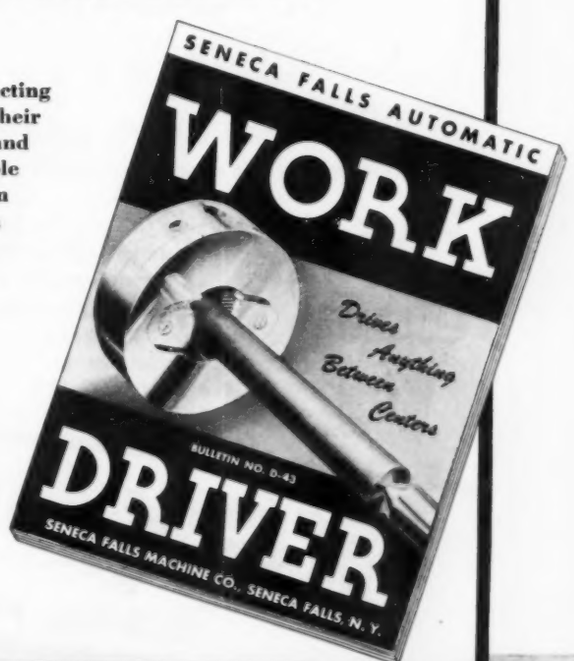
SENECA FALLS
Automatic
WORK DRIVER
Drives Anything Between Centers



Jaws now available with angular serrations...

● These self-centering, quick-acting Drivers have long demonstrated their ability to eliminate dogging time and to enable one operator to attend multiple machines. Now their application has been widened with development of a new jaw having serrations milled at a suitable angle. These angular serrations provide an overlapping contact for surer and quicker grip on smooth finished, as well as hot rolled stock and forgings having a relatively hard surface. This positive grip eliminates slippage and resultant tool breakage... especially important when costly carbide tools are used.

Seneca Falls Work Drivers are designed for use on any engine or multiple-tool lathe and for certain work on turret lathes and grinding machines. In addition to time-saving, the Seneca Falls Automatic Work Driver provides greater safety for the operator since there are no projecting screws or sharp corners to catch clothing or injure hands. Made in 18 standardized models for work diameters ranging from ¼ to 6⅞ inches. Write for Bulletin D-43.



SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

"KEX" *Industrial Wiping* TOWELS

General View of Diesel Engine Test Shop, Baldwin Locomotive Works, Philadelphia, Pa.

. . . More Important Every Day to the *AMERICAN INDUSTRIAL SCENE*

This, a great Diesel Engine plant, is one of many of America's vital industries where KEX Industrial Wiping Towels contribute to greater efficiency of operation.

The reason why KEX Industrial Wiping Towels have won for themselves such an important role is because they have been produced *for wiping only*. They have no harsh seams . . . no hidden buttons . . . no abrasive particles to mar delicate and expensive surfaces.

They come in neat, easily stored bundles that help control distribution—*every wiping towel* in the lot is *thoroughly cleaned and inspected before delivery to you.*

Take your cue from industrial leaders who make it their business to keep operating costs down—and efficiency up.

Nothing to Buy—No Expensive Inventory—Just a Low Monthly Rental. The first month should show a decided saving on wiping costs.

For complete information, see your classified Telephone Directory for nearest KEX distributor, or write KEX NATIONAL SERVICE, 295 Fifth Avenue, New York 16, N. Y.

"KEX" NATIONAL SERVICE

REG. U.S. PAT. OFF.

Windsor, Orange County, N. Y., sold to Ships and Power Corp. of Barber, N. J., for $202,400. The property will be used for ship repairing and diesel engine manufacture.

Major part of the West Yard of Stockton, Calif., sold to Walter W. Johnson Co. for $72,500.

Maritime facility at Savannah, Ga., sold to the Savannah Port Authority and Industrial Committee of Savannah, Inc. for $357,112.

Smile, Darn Ya!

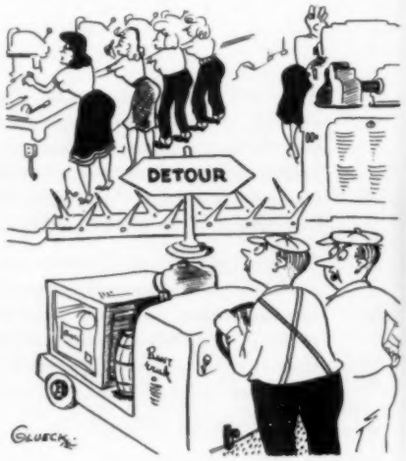
W. R. OLSON, of Minneapolis, Minn., is certain the world would be a better place to live and work if everybody would try to generate more smiles. He cites the plaintive case of the ditch digger as follows:

I digga da ditch
To maka da mon
To buya da grub
To getta da strength
To digga da ditch

Despite the ditch digger's philosophy, Mr. Olson believes he has time to break out in a smile "because a smile costs nothing but gives much. It enriches those who receive without making poorer those who give. It takes but a moment but the memory lasts forever. None is so rich or mighty that he can get along without it and none so poor that he can be made rich by it.

"A smile creates happiness in the home, fosters goodwill in business, and is the countersign of friendship. It brings rest to the weary, cheer to the discouraged, sunshine to the sad, and it is nature's best antidote for trouble. Yet it cannot be bought, begged or stolen, for it is something that is of no value to anyone until it is given away. Some people are too tired to give you a smile, so give them one of yours, as none needs a smile so much as he who has no more to give."

Brother, can you spare a smile?



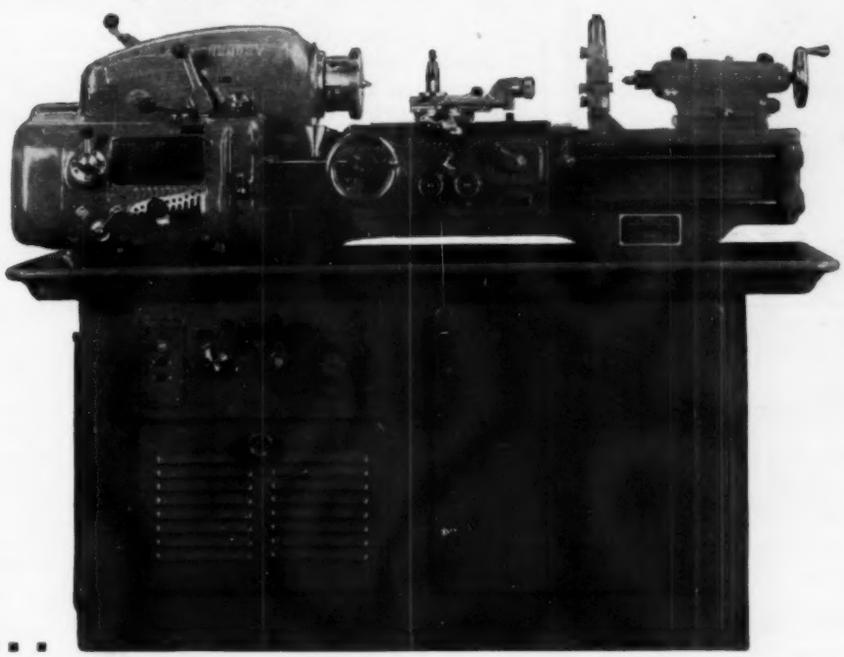
"See what comes of having given in to an urge to slap"

THE NEW HENDEY 9"x 24"

TOOL AND GAGE MAKER'S LATHE

GIVES YOU THESE LONG-WANTED FEATURES

1. *Greater Capacity* — 1⅛" maximum capacity of Spring Collets.
2. *Finer Control* — 66 different feeds, 66 different threads without gear change.
3. *Higher Speed* — Up to 2000 r.p.m. forward and reverse.
4. *Greater Sensitivity* — Stepless speed over entire range provided by DC power unit.



AND MORE . . .

To insure precise production the new Hendey 9"x24" has these additional features. Hardened and ground spindle runs in super precision, preloaded, anti-friction bearings. The lead screw is held to .0005" per foot of lead and is used only for thread cutting. A separate feed rod, independent of the lead screw, is provided. Lubrication is automatic throughout.

The new Hendey 9"x24" is the precision lathe that fulfills a long standing desire of tool and gage makers everywhere. Full information on this highly accurate, sensitive and versatile lathe, is contained in the new 9" x 24" catalog—send for it today.

The Hendey Machine Company

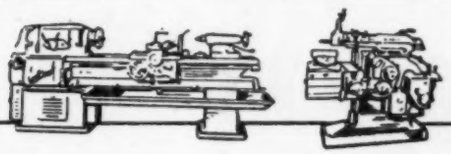
Hendey

Main Office and Plant — Torrington, Connecticut

Offices — N. Y., Chicago, Boston, Detroit, Rochester, Los Angeles, San Francisco

Representatives in — Philadelphia, Cleveland, Pittsburgh

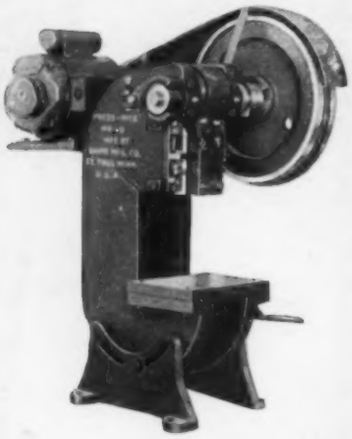
TOOL ROOM LATHES
12" - 14" - 16" - 18" - 20"



SHAPERS
12" - 16" - 20"

STEP UP YOUR PRODUCTION WITH

PRESS-RITE PRESSES



No. 0-5 TON

SPECIFICATIONS

Dia. of Crankshaft at Bearing and Pin	1⅛"-3"
Standard Stroke	1¼"
Adjustment of Slide	1¼"
Dist. Bed to Slide, Stroke Down, Adj. Up	7"
Dist. Bolster to Slide, Stroke Down, Adj. Up	6"
Bolster Thickness	1"
Bolster Area	7" F.B., 8½" R.L.
Opening in Bed	3⅝"x6¼"
Dist. to Back from Center of Slide	4"
Opening in Back	3⅜"
Area of Slide	2¾" F.B., 3½" R.L.
Dia. of Hole in Slide for Die Shank	1" Round
Stroke per Minute	138
Motor Required	⅓ H.P., 1140 R.P.M.
Shipping Wt. Less Motor, Approximately	315 lbs.

Standard equipment includes bronze bushings throughout, knock out bar in slide, semi-steel bolster plate, motor drive unit, single stroke attachment and brake.

Extra equipment available, floor legs, longer stroke than standard, belt guard.

INVESTIGATE

For complete information see your local dealer or write to Dep't A-348

Sales Service Machine Tool Co.

2363 UNIVERSITY AVE.
ST. PAUL 4, MINN.

Timekillers I Have Known

1. During the last war I came upon a person whose sole purpose in life was to do the least for the most. Mr. Visitor let slip the fact that he was employed at a nearby shipyard which he described thusly:

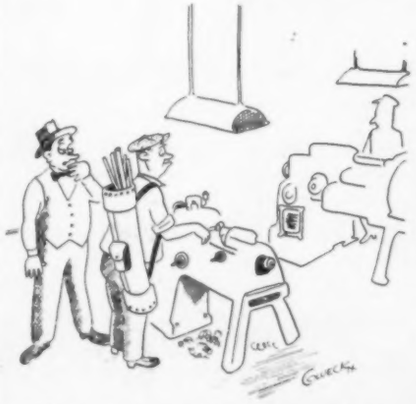
"It's a swell place. You can kill time like Hell down there, and nobody seems to care."

2. Tom B— performed his work with a clear conscience until his application for more pay met with a cold rebuff. He soon instituted his own means of reprisal. If, by any chance, the floorsweeper cleaned up around his shaper during his absence, he quickly reached for a box of chips and spread them over the floor about his machine. Then he basked in sweet revenge.

3. Mack was a jovial Englishman who smoked a strong-smelling pipe. Smoking during working hours was forbidden, so Mack would take an old tool to the forge shop to be dressed. While the tool was being pounded into shape, he would crouch down behind a large, reverberatory gas furnace nearby to enjoy a few satisfying puffs. The mere striking of a match savored too much of Taylor efficiency for Mack, so he always made up a long taper out of newspaper, lighting from a furnace pilot.

One morning, Mack found to his dismay that the pilots were not burning. He did not realize that the combustion chamber was filled with good, wholesome gas. He made his long lighter and laid it carefully to one side, then fussed around in his vest pocket for a match. He could have lighted his pipe direct, but that would have been too quick. His intention was to light the pilots first, then his taper. His match got as far as one pilot—and all Hell broke loose, sending him into a big pile of soft-coal dust close by.

John Homewood
Ontario, Calif.



"That's a clever idea—having brass rod right handy like that!"

CROSS UNIVERSAL GEAR MACHINES *for*

- ROUNDING
- CHAMFERING
- POINTING
- BURRING

Cross Universal Gear Machines embody advanced engineering developments to obtain highest productivity and assure lowest possible operating costs.

They feature utmost flexibility for handling a wide variety of gears. Continuous cutting motion, exclusive with Cross, speeds production at top efficiency.

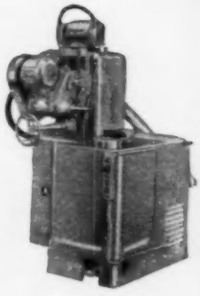
Special skill is not required because machines are automatic and push button controlled. Power clamping is foot pedal controlled. Both hands are free for work handling.

No. 55

For rounding, pointing, chamfering or burring external and internal:

spur gears
helical gears
clutches
splines

Typical productivity when rounding or pointing 8 pitch 30 tooth gears is 55 net hourly.



No. 65

For pointing or chamfering external and internal:

clutches
spur gears
bevel gears
splines

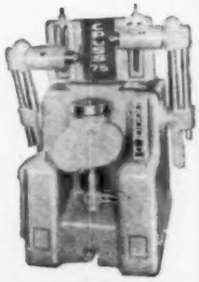
Typical productivity when pointing 10 pitch 30 tooth gears is 100 r at hourly.

No. 75

For burring or chamfering both ends at the same time.

helical gears
spiral bevel pinions
hypoid pinions

Typical productivity when chamfering 8 pitch 40 tooth gears is 200 net hourly.

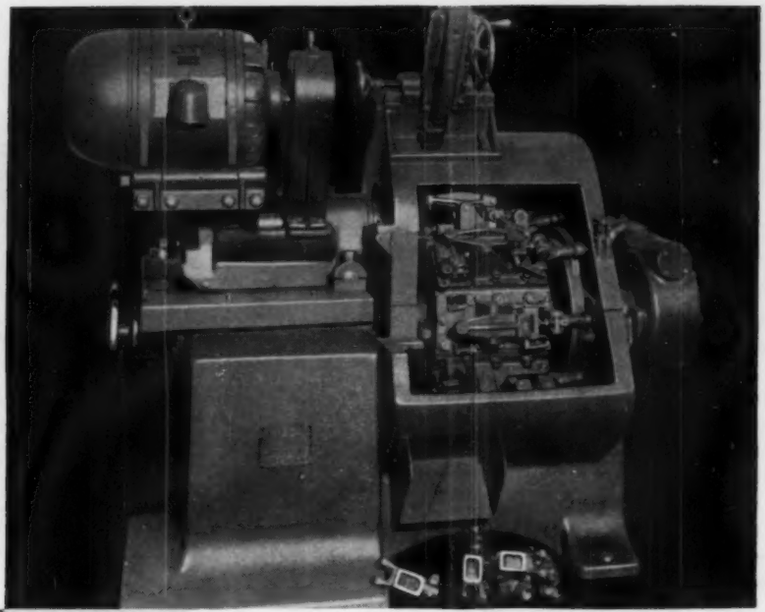


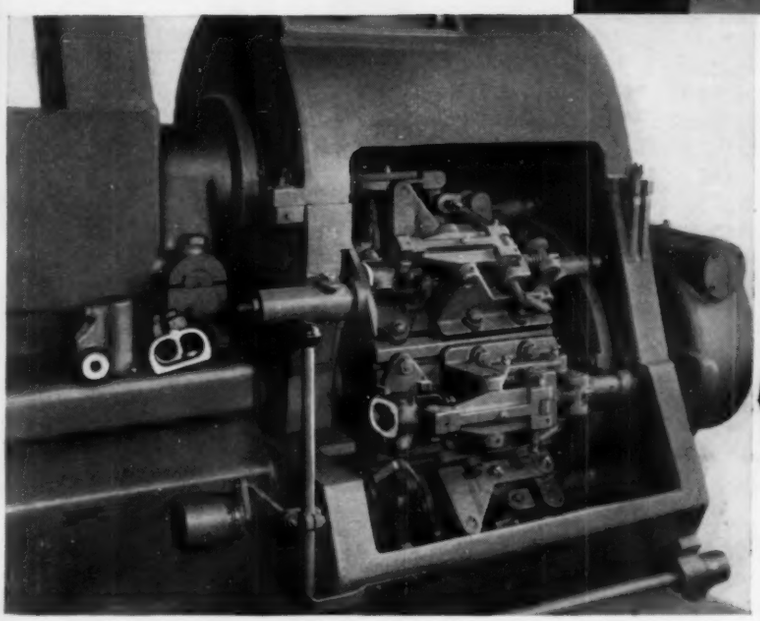
THE **CROSS** COMPANY
Established 1898

SPECIAL MACHINE TOOLS
MILLING • DRILLING • TAPPING • BORING
TURNING • SHAPING • GRINDING • HONING

DETROIT 7, MICHIGAN

Gardner Grind—





for FAST, ACCURATE low-cost PRODUCTION

WORK DATA

Part Shock absorber bodies
Material Cast Iron
Operation Grind Face
Tolerances .002" to .003" for flatness
Stock Removal .025" to .030" maximum
Production 600 to 800 pieces per hour
Feed Hand Load and Gravity Unload
Machine No. 122-23" Semi-automatic Gardner Grinder

● HIGHLY-PAID labor using *obsolete machines* to work top-price materials, can't long survive. The solution is to *modernize* both methods and machines.

Modernized in design and construction, the No. 122-23" Semi-Automatic Gardner Grinder, shown above, carries an automatically revolving 8-sided drum with cam-clamping fixtures. This machine has helped shop officials to "lick" many high-production, low-cost problems — such as face grinding shock absorber bodies, as in the "close-up" photo.

You can reduce your flat-surfacing costs with modern Gardner Grinders —

Write for our "MODERN METHODS" Booklet!

GARDNER-GRIND YOUR *Flat* SURFACES

GARDNER MACHINE COMPANY

410 East Gardner Street . . . . Beloit, Wisconsin, U.S.A.

ROUND TABLE Discussion

CODDLE OR CULL?

Before any dogmatic solution can be applied to the problem of absenteeism, the causative factors should be determined. They may be due to conditions existing in the industry, or external to the industry, and conditions in the personal life and experiences of the worker.

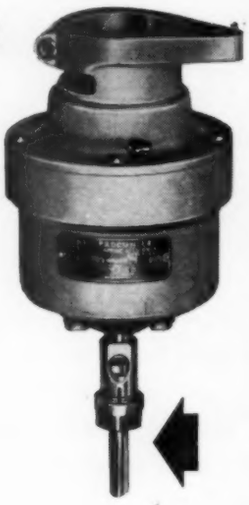
The primary point of attack in any plan for reduction of absenteeism is the establishment of an efficient department of industrial relations, a major function of which should be the collection of data on absenteeism, analysis of causative factors, and provision of ways and means of reducing absences to an unavoidable minimum. A general knowledge on the part of the workers of the fact that absences are investigated tends in itself to reduce the rate of absences materially, and prompt medical aid cuts down the length of absence in cases of sickness. The follow-up of absences is an extremely important part of the program for reduction of absenteeism.

The practice of some firms of imposing fines for absences is not conducive to best results, since many workers will pay a fine, feeling that in so doing, all moral responsibility on their part for regularity has ceased.

Another system for reduction of absenteeism, the granting of a bonus for perfect attendance (a percentage bonus based on attendance), is used as a preventive rather than remedial measure in establishing regular attendance.

However, when the ordinary conditions of employment are such as to stimulate interest in regularity and create a sense of loyalty and appreciation on the part of the workers, no other means will need to be employed. The wage scale must be adequate, the physical conditions of employment should protect workers from accident and sickness, sickness and accident must be detected promptly, and when necessary the worker must be sent home, given medical attention, and urged not to return to work until he is perfectly well again. The atti-

"We've Found PROCUNIER Tapping Heads PERFORM BEST!"*



That's what they all say . . . men who have used Procunier Tapping Heads in the shop for years. Consistent, accurate tapping and faster tapping with a minimum of tap breakage . . . *as reported by actual users* over the years . . . has made "Procunier" the standard of the industry. Such features as the sensitive, double-cone friction clutch, which engages the surfaces of the drive and reverse shells with a soft, "cushioned" action . . . the heat-treated gear reversing mechanism . . . the ball bearings for long life and accuracy . . . the simple, single-hole lubrication, have made Procunier noted for *economy, accuracy* and *better performance*. See how these Procunier Heads . . . proven on all kinds of jobs for over 30 years . . . can save you time and money. *Write today for brochure giving complete prices and specifications on the entire line.*

* Name on request.

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"Tru-Grip" Tap Holder

Lighter, smaller in diameter, it affords easier tapping close to walls or shoulders, eliminates "chewed up" tap shanks.

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Gentlemen:

Please send your illustrated brochures which gives complete prices and specifications on Procunier High Speed Tapping Heads and Machines.

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The *easy-working, tough-hardening* quality distinguishing our fine Tool Steels, and known to every customer, is a Vanadium-Alloys accomplishment based not on "magic" but on *controlled melting formulas.*

These formulas are private—exclusive developments of Vanadium-Alloys' metallurgical research extending over forty-five years, devoted solely to the improvement of tool steels for every industrial purpose. As a user of our Tool Steels, you benefit by the *results* . . . so unmistakably evident in service!

Visit us at Latrobe to inspect our plant and processes—you'll be welcome!

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I-T-E Circuit Breaker Co. Reveals 57% Reduction In Slotting Time!

Nelco Carboloy-Tipped Tools Cut 100 Slots IN 1.4 HOURS

Instead of former 3.2 hours with usual type steel cutters

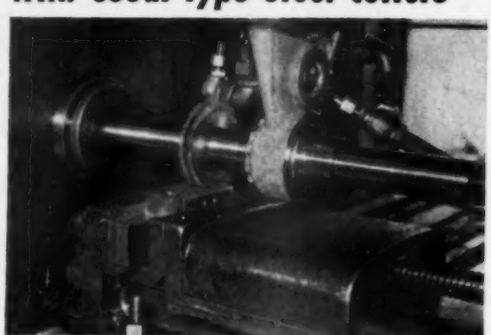

Photo Courtesy of I-T-E Circuit Breaker Co.

In Gangs of 2 (Sometimes 3) Nelco Carboloy-Tipped Cutters Set New Records In Doubling Production

Compare This Operation Record Now!

Job: Cut slot ½" deep, 5" long, .252 wide.
Material: Hard extruded copper terminal block.
Machine: Kearny & Trecker, 20 CSM Milling Machine, Horizontal Type, Spindle RPM of 1250.

With Usual-Type Steel Cutters

3.2 hours to cut 100 slots.
Table feed of 5⅛" per min.
Did not hold size due to high amount of wear caused by hard copper.

WITH NELCO CARBOLOY-TIPPED CUTTERS

1.4 hours to cut 100 slots.
Table feed of **90"** per min.
3200 slots obtained before dulling or loss of size occurs.

CARBOLOY-TIPPED CUTTING TOOLS
NELCO TOOL CO., INC.
FOR THAT EXTRA EDGE IN PRODUCTION
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All Nelco Tools are designed and made to make production faster, better, cheaper. Write for the new Nelco catalog today—and for the name of the Nelco distributor nearest you.

tude of foremen and higher executives toward the employees must be congenial and their methods of supervision just, in order that causes of friction may be reduced to a minimum.

The most effective deterrent to absenteeism is the worker's knowledge that his employer practices the best and fairest type of industrial management.

Harry Kaufman
Phila., Pa.

•

Al suggests that absenteeism and indifferences are due to a little letdown on morale as a result of the late war. The late war has been blamed for everything. The war has been over more than two years, and it's about time that both worker and employer forgot it and the latter paid more attention to make sure the worker gets the best wages and working conditions and the former to give in return the most production he is capable of plus loyalty.

A good machininst can get a job almost anywhere today and lots have got a little cocky and independent. If a man is single and has no dependents he can get along well by only working three or four days a week, and lots are doing just that. Lots of employees have seen service overseas and won't allow themselves to settle down. Today a man can be unreliable in lots of respects, but if he is dismissed the union often fights it and gets him reinstated.

If you have among the fellows you supervise some who like to go for two or three days hunting or fishing or go to the races once in awhile and they are rated A-One employees, make it possible for them to go if you possibly can. They will appreciate it and come back and work all the better for it. A foreman doesn't get anywhere with his men by being tough about absenteeism, but in the case of a regular offender, cull not coddle.

To remedy absenteeism, I believe that a bonus at the end of five years' service every succeeding five years, based on a scale fair to both employer and employee in the matter of attendance. Make the bonus worthwhile. Some concerns are doing something similar to this already.

Arthur Silvester
Niantic, Conn.

•

Whether we like it or not, we are in the "coddling" age, and there seems to be no remedy for it. Absenteeism is only one phase of the problem. It is evident not only in

WITH THIS NEW SPEED AND FEED SELECTOR FOR *Enduro* STAINLESS STEEL BARS

SEND FOR YOUR SPEED AND FEED SELECTOR—TODAY. You'll find it one of your most valuable aids in machining ENDURO Stainless Steel Bars. *AND IT'S FREE!*

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BETTER QUALITY . . .
GREATER OUTPUT
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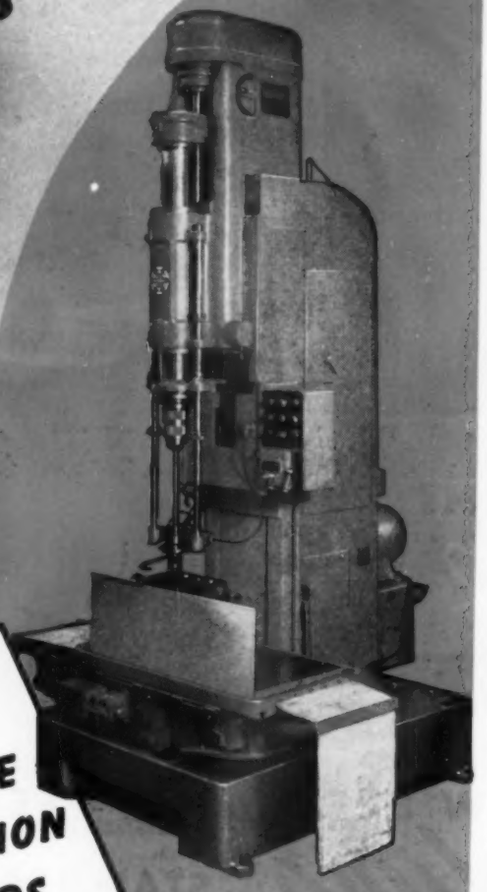
High Precision Surface Finish



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Completely automatic, electronic control of uniform size within tolerance of 0.0001 to 0.0003-inch is a production-proven feature of these new unit-assembled, hydraulically actuated, heavy-duty Hydrohoners.

With this simplified, spindle-in-quill construction torque and thrust is restricted to the centerline of the spindle—alignment is accurately maintained—weight of parts in motion is minimized—stroking speeds may be higher without increasing power input—all conventional mechanical linkages and hydraulic systems are simplified.

To explore the amazing, new possibilities of the Quicker, Better, Lower Cost Method of Production Processing by Microhoning.

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shops, but in mills, stores, offices, schools and homes. The politicians started it about fifteen years ago with their "you're a sucker if you work" philosophy, and the disease has spread rapidly. The "who cares" attitude is now common, and in nearly every organization there is only a small percentage who is willing to accept responsibility and who really try to do a good job.

In the case of shops, management must accept much of the blame for this condition. In spite of all the ballyhoo about soldiers of production, etc., everybody knows that worker efficiency and interest dropped to an all-time low during the war because management was indifferent to costs which were borne by Uncle Sam. It's no secret that inefficiency paid dividends, but unfortunately there comes a day of reckoning, and it has already arrived at a few plants. Appeasement and compromise with abandonment of old-fashioned principles of honesty and loyalty from top to bottom has produced a condition which only a national change of heart can correct.

There seems to be little hope for such a miracle. Most organizations can stand a lot of culling, but little will be done along this line until customers refuse to pay for inefficiency.

C. A. Johnson
Springfield, Mass.

•

EXPERT OR EXECUTIVE?

How much time Ed spends as a mechanical expert and how much as an executive depends largely on the shop organization, kind of work performed, and the type of help employed. Generally speaking, we feel that Ed should give little time to repair jobs and none to doing the work himself while his men look on. There are exceptions, and we do admire a foreman who can step in where others fail, and get things going.

In some shops working agreements prohibit formen from doing work as mechanics. The day will come when Ed will not be present and the jobs in question will have to be done by some other person. No man should be allowed to become so important that his absence will "stop the works."

Ed wants to know as much as possible about the details of affairs in his department. It would encourage Ed to provide him with drawings and instructions pertaining to all machines in his department and also provide him with a place suitable

Sail the Seven "C's" of Production...

COST
CLASS
CONTROL
CONFIDENCE
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CRAFTSMANSHIP
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with Axelson Lathes

Axelson Lathes, of various lengths, are manufactured in 14, 16, 18, 20, 25 and 32-inch sizes. Also 20 and 25-inch hollow spindle "Oil Country" Lathes.

The investment you make when you buy a heavy duty engine lathe justifies a most careful selection . . . If you *thoroughly* canvass the market you will find that the *Axelson* heavy duty lathe really does *have everything* . . . With your voyage of lathe discovery behind you the name of Axelson will loom up boldly ahead . . . A name which stands against a background of quality, metallurgy, accuracy and low per-piece cost of production . . . More than thirty years of "quality first" manufacturing principles, with complete construction at the home plant, combine to give you supreme *Axelson Lathe satisfaction.*

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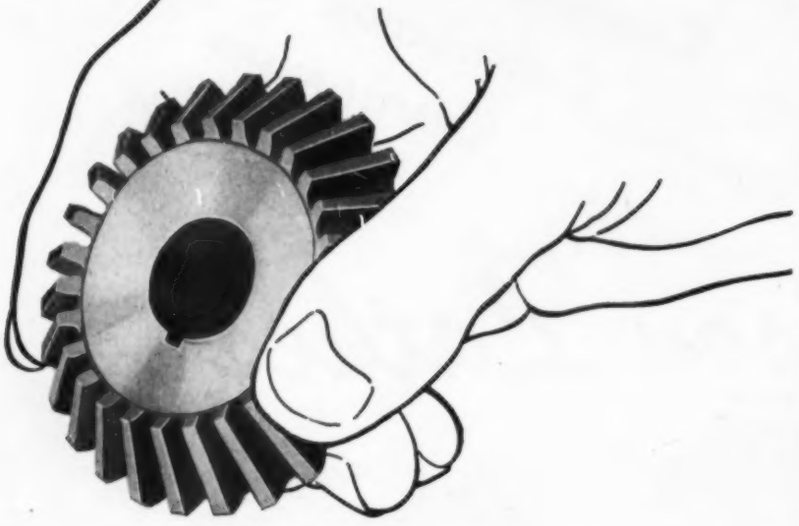
THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

Lathes

DEPENDABLE FOR OVER A QUARTER CENTURY

PERKINS' contribution to industry
trouble-free power transmission



Whatever your gear requirements may be, we have the experience, equipment and facilities to fulfill them to your complete satisfaction.

Since the proof of the pudding is in the eating it may be pointed out that the manufacturers of the type of consumer goods which have a world-wide reputation for quality use PERKINS Custom-Cut GEARS as a matter of course.

You Furnish the Specifications • We'll Produce the Gears

• **PERKINS MAKES — In All Materials, Metallic & Non-Metallic** Helical Gears Bevel Gears, Ratchets, Worm Gears, Spiral Gears, Spur Gears, Ground Thread Worms

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Springfield 2, Massachusetts

Our extensive facilities and modern machine tools are also adaptable to the manufacture of all kinds of various parts other than gears, such as the following:

SPROCKETS SPLINED SHAFTS SCREW MACHINE PARTS
up to 2¼" in diameter

We are also exceptionally well equipped to build, to your specifications, such mechanical units as—

PUMPS • SPEED REDUCERS & COMPLETE MACHINES

either in experimental or production quantities. Our well-known reputation is your guarantee of satisfaction. Let us quote on your requirements.

for the filing of such material. Duplicates of the books or instruction sheets should be retained in some live file in the main office and Ed should sign a receipt for all such matter furnished. When a new machine is purchased, Ed and the big boss may go over instructions carefully, noting and marking items of special importance on all copies, for a machine tool costing thousands of dollars should be given careful attention by all.

Ed's energies should not be abated, but diverted, and while retaining all of the know how of a high-grade mechanic, he should develop his ability to better supervise the work of others.

F. M. A'Hearn
Greenville, Pa.

•

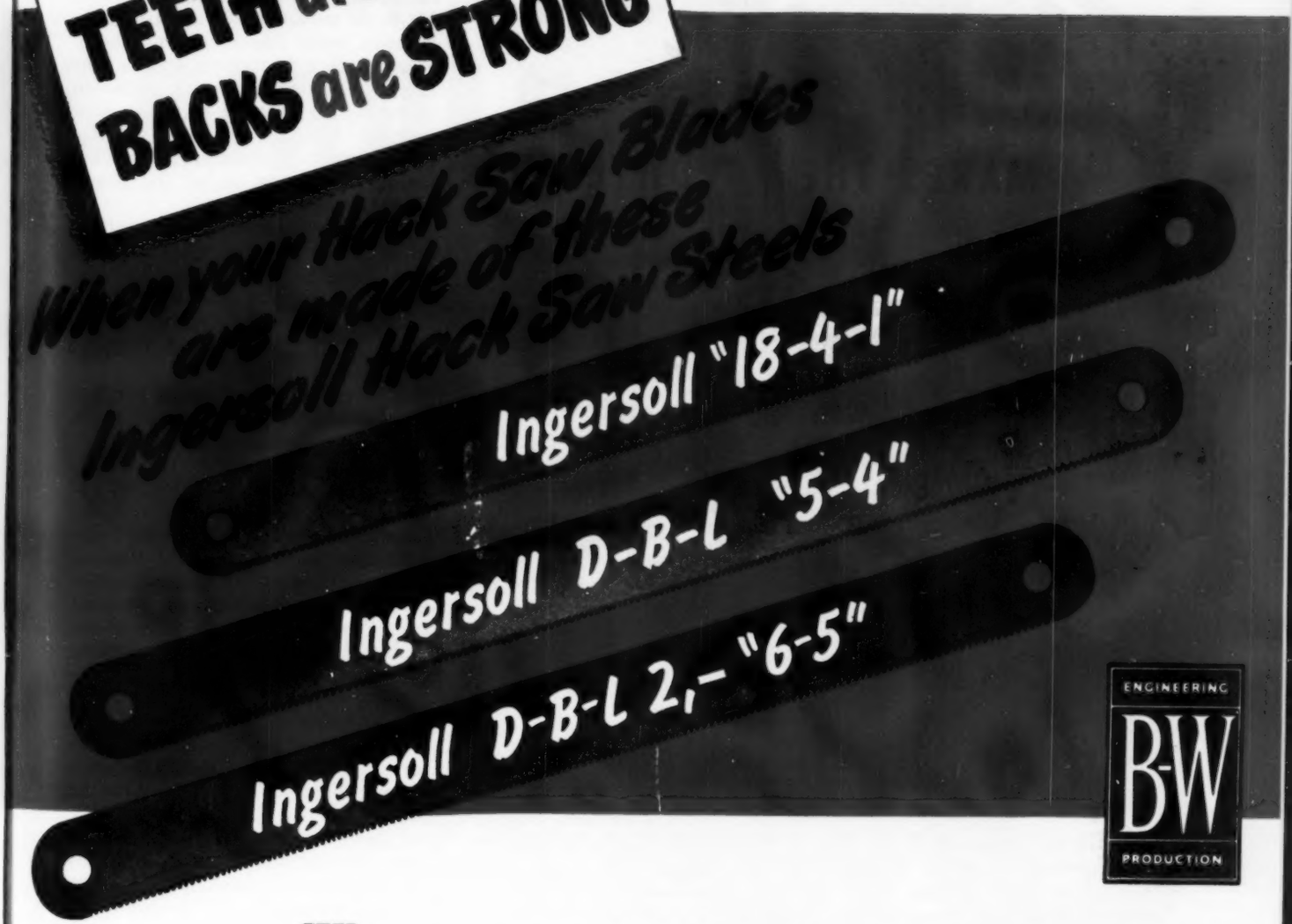
How much recognition is management prepared to give to the professional executive? Some acknowledgment must come sooner or later since the recurring necessity for hiring management executives for this and that phase of the operations makes a recorded heavy expenditure on the company's books. The explanation to the shareholders, or even to oneself, is such that it should spark the question, "Why isn't someone here qualified to do that?"

Therein lies the answer to "expert or executive." Every phase of business leadership is requiring yearly a more specified knowledge of its own—knowledge that takes time to acquire and time to assimilate.

The foreman who once came to work in virtually the same shirt and pants he wore as a core maker, puddler, machine operator, or trucker to get the work out is fast vanishing, not only because management meetings, supervisory luncheons, require some concession to a white-collar appearance, but his absence from the scene of work to take part in these activities, as well as on-the-job discussions with union stewards, timestudy men, attention to the men's personal problems, etc., definitely eliminate an opportunity to demonstrate "expert" tendencies. Therefore, he does one of two things—either he lets future events take care of themselves, or he hires someone specifically for the job. In any case, an "executive" is born.

This, in the final analysis, is as it should be, for while it is all to the good for the foreman or executive to have the actual "do how," he is definitely not using supervisory

TEETH are TOUGH BACKS are STRONG



ENGINEERING B-W PRODUCTION

Whenever you order hack saw blades from your regular hack saw blade maker, be sure to get blades with tough teeth and strong backs. Whichever type you prefer, you'll find that INGERSOLL "18-4-1" and INGERSOLL D-B-L Steels give you blades with tougher cutting edges, higher impact resistance and relative freedom from decarburization.

So for tough blades that give a smooth, easy cut, take advantage of Ingersoll's lifelong research in special steels! Specify hack saw blades made of INGERSOLL "18-4-1" or INGERSOLL D-B-L Hack Saw Steel.

*Furnished in INGERSOLL D-B-L "5-4" and INGERSOLL D-B-L 2, "6-5".

INGERSOLL *Steel Division*

BORG-WARNER CORPORATION • NEW CASTLE, INDIANA

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INGERSOLL "18-4-1" INGERSOLL D-B-L* *Hack Saw Steels*

INGERSOLL *Special* STEELS for *Special* USES

Control MAKES THE DIFFERENCE

THIS *all-purpose* R. D. Wood HYDROLECTRIC Horizontal Forcing Press for general machine shop and maintenance service is the ideal press for assembly and disassembly of heavy machinery components. And here's why: *Control makes the difference* . . . control of operation by means of the special lever-operated control valve which permits:

1. *Main cylinder on pressure. Pullback cylinder on pressure. High speed forward—*
   12.7 tons at 400 psi—57"/min.
   56 tons at 1,770 psi—12.7"/min.
2. *Main cylinder on pressure. Pullback cylinder on exhaust. Slow speed forward—*
   22.6 tons at 400 psi—32"/min.
   100 tons at 1,770 psi—7.2"/min.
3. *Neutral—pumps by-passing to oil reservoir.*
4. *Main cylinder on exhaust. Pullback cylinder on pressure. High speed return stroke—72.5"/min.*

This press in other designs, various sizes and capacities is available to meet a complete range of manufacturing and maintenance requirements. Send today for more detailed specifications or engineering advice. R. D. Wood Company, Public Ledger Bldg., Independence Square, Philadelphia 5, Pa.

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EST. 1803

"know how" in having his eggs in one basket, even if they are his own. To do so seems rather shortsighted, because, with this reasoning, there are recurring factors he ignores entirely: his absence through illness or during the vacation period, to say nothing of the restrictions to his own chances of self improvement by seeing what goes on in the other shops, or at the shows.

By all means let the "executive" be an "expert" or vise versa, but one at a time; he cannot be both. To succeed at one is to fail at the other.

A. M. Elliott
LeRoy, N. Y.

•

The foreman should know his job and be so thoroughly experienced that he can pitch in when it becomes necessary to demonstrate his idea or a method of handling work to advantage. This only takes minutes sometimes, and it should never extend into such a length of time as to cause neglect to other routine matters. If he is handling a job tool-die or machine shop, it is most essential that he know his business. If he doen't know it, cost of machining and handling work is bound to be higher. The experienced man is bound to have higher morale in any shop due to his ability to pitch in and show he backs up what he says.

I have actually seen this type of man overestimated in one shop by his tendency to pitch in. However, he held the respect of the men, which was the main thing.

In my experience of 40 years around four states, I have seen three of these inexperienced men who could not pitch in come to grief. Two of them badly demoralized several big machine-tool rooms. The other put a fair sized job tool-die shop out of business. So give us the experienced type of pitch-in man in charge in preference to the drone type of overseer.

Henry Rasmussen
Niagara Falls, N. Y.

•

LEARN OR EARN?

Hand in hand with the proper selection of boys for apprentice training lies the equally important factor that course must be interesting. Should either of these points be overlooked or neglected, neither the apprentice nor the employer will be greatly benefited.

Proper selection is the first important factor to consider when hiring an apprentice. The real purpose of apprentice training is to develop

up to *500% Greater*
SPINDLE RIGIDITY

This ring was machined in a lathe equipped with a spindle of ordinary design. Bearing yield or deformation resulted in heavy chatter marks.
This ring was machined in a lathe of same make and model, except that it was equipped with SKF Spindle Bearings. The same cutting tools were used, and the speeds and feeds and spindle diameter were the same. No chatter marks resulted.

THE DIFFERENCE BETWEEN THESE CUTS SPELLS SPINDLE RIGIDITY

DOUBLE ROW CYLINDRICAL ROLLER BEARINGS OFFER

- rigid support of inner ring; elimination of creep under load.
- firm support of outer ring due to press fit in the housing.
- greater spindle rigidity through positive control of internal radial clearance.
- lapped rollers of "Gauge Makers'" accuracy, running smoothly on honed roller paths.
- low friction and low temperature under varying loads and speeds.

THRUST BALL BEARINGS OFFER

- maximum axial rigidity.
- freedom from the necessity of adjustment to accommodate changes in load and speed conditions.
- minimum "camming" action of spindle, owing to precision tolerances.
- low friction and low temperature under varying loads and speeds.

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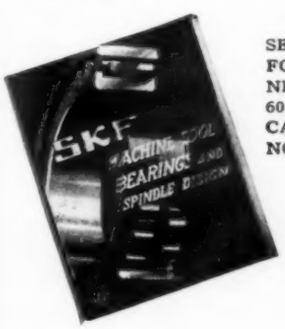

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BALL AND ROLLER BEARINGS

THE RIGHT BEARING FOR THE RIGHT PLACE

OUT OUR WAY

YOU AIN'T HURT, PHIL? STAY RIGHT THERE A MINUTE--WE WANT TO IN-VESTIGATE THE CAUSE OF THIS!
IT USED TO BE A DISGRACE TO GET CAUGHT IN A MACHINE WHEN THEY WAS EASY TO GET CAUGHT IN--NOW WITH THEM MADE SAFE, YOU'RE A KIND OF HERO!
IT WASN'T TH' MACHINE'S FAULT-- STEPPED RIGHT INTO THAT OIL--SLID RIGHT INTO TH' MACHINE! NOW MEBBE WE'LL GET SOL-SPEEDI-DRI!
J.R.WILLIAMS
FOOLING THE INVENTOR
T. M. REG. U. S. PAT. OFF. COPR. 1945 BY NEA SERVICE, INC.

IS YOUR SHOP THE "STOMPING-GROUND" FOR ACCIDENTS?

Contrary to the popular saying, accidents don't just *happen!* They are caused . . . and the most frequent cause of accidents in the shop is greasy, oil-slick floors. Put a firm footing under your employees with SOL-SPEEDI-DRI . . . and watch *accident-rates* take a fall! SOL-SPEEDI-DRI is the fast-working absorbent that soaks up all liquids like magic. Reduces fire-hazards, too, for SOL-SPEEDI-DRI will not readily burn, even when oil-soaked.

Safety and Maintenance Co., Inc., No. 1 Wall Street, New York 5, N. Y.

Warehouse stocks maintained in principal cities of the United States and Canada

material for supervisory personnel. Where do the professional teams get their players? Certainly not by placing an ad in the daily paper for a star pitcher or quarterback. From the time the boys begin playing ball on the sand lots, they are being watched. Why then should industry fail to comb the ranks for its future stars?

The degree of education, and the boy's ability to use it, is an important point in making a selection. His grades, conduct, interests and activities all have an important bearing upon his future possibilities. In selecting a prospective apprentice, who has had no previous practical experience, the considering factors are limited to his school record, general character, home life and ambitions. These must all be carefully weighed. If the boy is normal, physically and mentally, ambitious and interested in the field he seeks to enter, it can reasonably be assumed that he will complete his training and prove to be a worthwhile investment. His training program must, of course, be made interesting and adequate. The individual selected for an apprenticeship must fit into the demands of the program. It is unwise to select a youth for a given training course who is either far above or far below the required qualifications. The first will not be satisfied, while the other no doubt will prove to be a burden.

The next and equally important factor to consider when desiring to keep an apprentice is the necessity for the employer to make the training program interesting and adequate. Any intelligent young man about to enter apprenticeship training expects to receive certain benefits in consideration for the lower wage scale.

Too long a period on one job will lead to discontent; therefore, the apprentice must be changed constantly to keep up his interest and give him the varied experience that the program specifies. His training program should include regular lectures on various branches of the work, trips through all departments of the plant, as well as occasional visits to other plants. He should be encouraged to devote extra hours to special study—and given credit for doing so. Foremen and supervisors are expected to take a special interest in apprentices, for the benefit of the individual as well as the plant.

Personnel selected for training apprentices should be carefully chosen among men who know their work exceptionally well and welcome the

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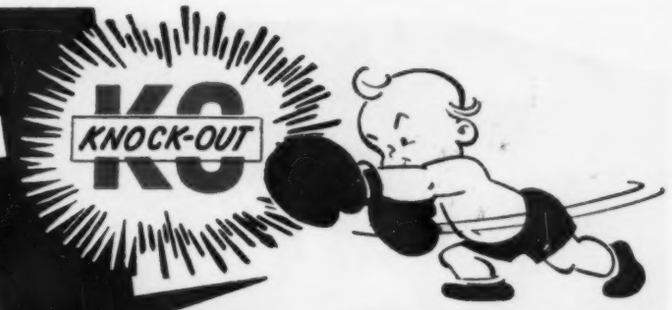

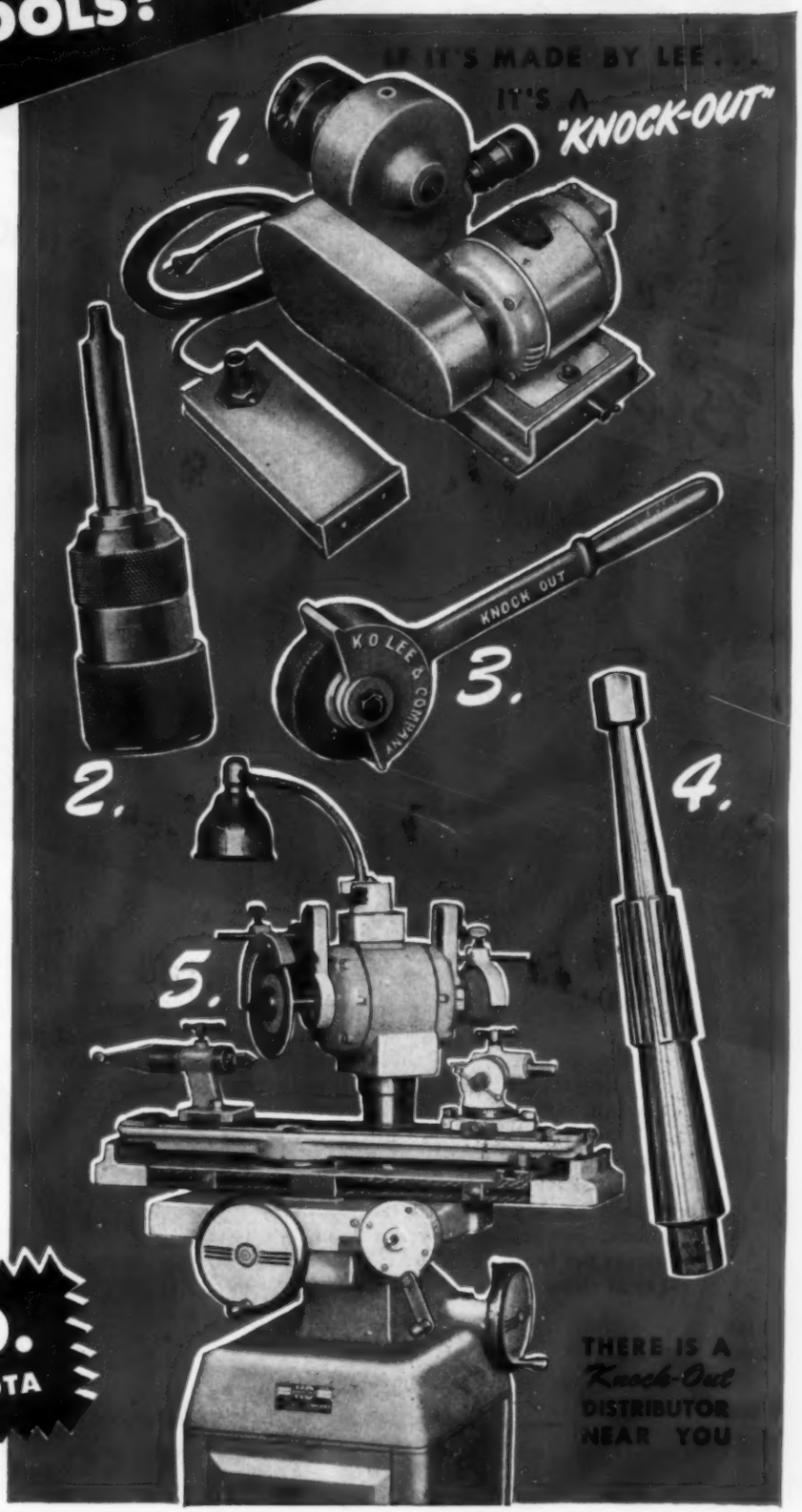

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Ream, hone, burnish, lap, etc. Has two-jaw universal chuck (1-5/8") K-O Keyless Drill Chuck (⅝"). Two models—40-1 and 20-1 gear ratio; speeds 20-120 R. P. M. Speed reducer unit may be purchased separately.

2. *Knock-Out* KEYLESS DRILL CHUCKS

No more drills ruined by slipping! This fast-positive-self-energising chuck tightens in proportion to work load. Releases with finger-tip pressure. Ideal for production or tool room. Five sizes, 0 to 7/8" capacity.

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4. *Knock-Out* EXPANDING MANDRELS

One-piece expanding sleeve holds firmly, accurately, on milling, turning, grinding operations. Quicker, easier to use; five mandrels cover 3/8" to 2-½". Other sizes up to 5½".

5. *Knock-Out* UNIVERSAL TOOL GRINDER

Universal grinders, carbide grinders, and chip-breaker grinders. Models and sizes to fit every shop, large and small. Simple to operate, accurate, ruggedly built for long service.

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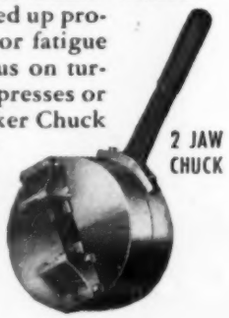
ABERDEEN, SOUTH DAKOTA

Barker Two-Jaw or Three-Jaw WRENCHLESS CHUCK

Will pay for itself in 60 to 90 days on production schedules by giving MORE parts per hour at a LOWER cost per part. Most round parts can be set in the Barker Wrenchless Chuck without stopping the machine. It saves time, helps speed up production, is simple to operate, reduces operator fatigue and cuts spoilage where the run is continuous on turrets, engine lathes, cutting off machines, drill presses or any other type of chucking machine. The Barker Chuck shown above, replacing an ordinary 3-jaw chuck, jumped production from 18 to 24 pieces per hour. It can do it in *your* plant too. Let us show you how!

Write for bulletin 201 today.



—Chuck Division—
THOMAS HOIST CO.
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opportunity to devote much of their time to training others.

If you need someone to run a power saw or small drillpress, don't talk some kid into signing up for an apprenticeship and expect him to run these machines for three years at half the wages and be satisfied—he won't. If you don't need an apprentice, don't waste his time and yours, but get a man that can do the job without having the idea that he might be superintendent some day.

It's pretty hard to keep a good man down. If you've helped to make him what he is, give him a pat on the back and wish him luck. He may return, and, with wider experience, prove more beneficial than originally expected. Don't forget that there are highly trained men coming into your plant from time to time who have been trained by others at the expense of other plants.

A. F. Scoblic
Milwaukee, Wis.

•

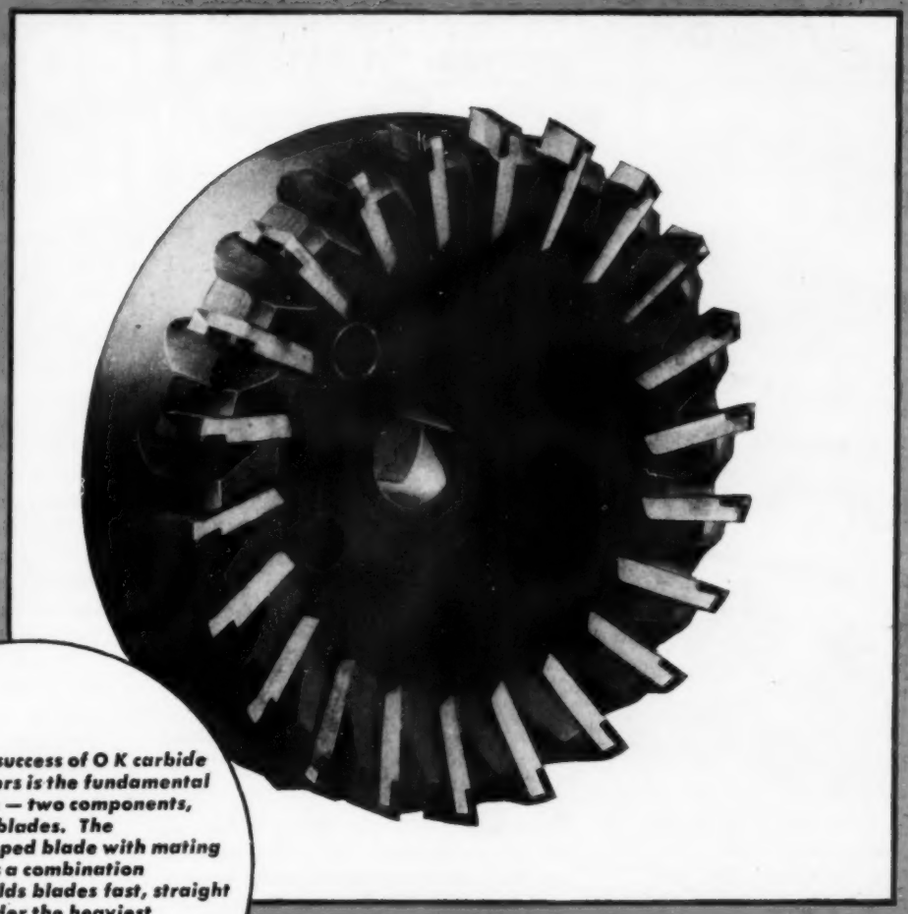
Problems like those confronting Ed began when apprentices were no longer bound to work any specified length of time—or even before, because some of them jumped the gun in spite of indentures that seemed to be ironclad. The problem will continue to exist as long as wages are based solely on direct production and an "operator" on piecework can earn more than an all-round machinist, as too often happens. The same thing might have happened if Williams had been graduated as an apprentice and was getting journeyman's pay.

It has long been true that a bright lad could be trained to turn out big production in a comparatively short time, especially on the oldtime piecework basis. This has meant that he often drew more wages than the skilled mechanic who set up his machine, who could handle any machine in the shop, and who kept the operator's machine in shape to produce. Too many shops overlook the value of these all-round men, even though production would soon fall off if they failed to keep the machines in good order.

One large auto company used to have its maintenance men, who were all-round mechanics, share the group bonus of the departments in which they worked. Being constantly on the job, they frequently prevented breakdowns and delays which would have cut production.

No matter what method is used, Ed and his employers can only hope to keep their good apprentices (espe-

carbide: dual adjustable milling cutters



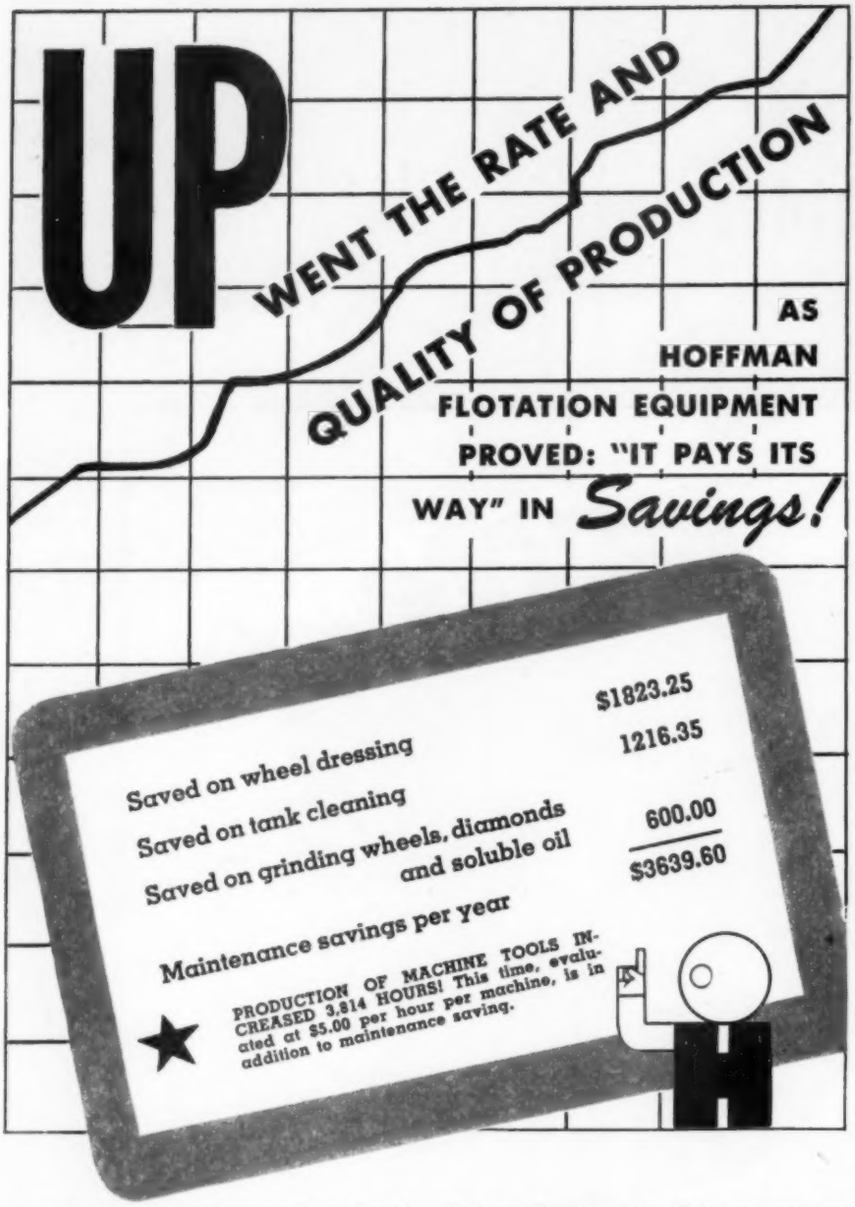
Back of the success of O K carbide milling cutters is the fundamental basic design — two components, body and blades. The *wedge-shaped blade with mating serrations is a combination lock that holds blades fast, straight and true under the heaviest cuts. No screws, pins, gibs or other locking devices are required!

****The wedge is the world's simplest and strongest basic mechanical device.***

Made in two types: Inside type provides the major blade adjustment (4:1) on the periphery; Outside type on the face (1:4). This patented feature gives maximum blade life, the strength and rigidity of solid tools. These cutters take full advantage of the power built into modern machines for milling with carbides. Production tests prove they are the most trouble-free cutters on the market. Write for new catalog 13.

OK milling cutters

The O K Tool Company, Inc., Shelton, Conn.

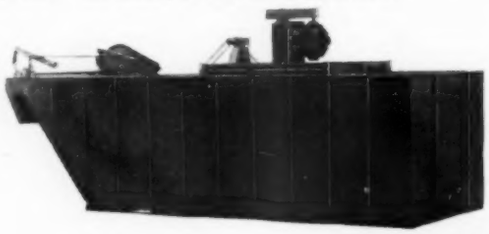

UP
WENT THE RATE AND
QUALITY OF PRODUCTION
AS
HOFFMAN
FLOTATION EQUIPMENT
PROVED: "IT PAYS ITS
WAY" IN Savings!
Saved on wheel dressing $1823.25
Saved on tank cleaning 1216.35
Saved on grinding wheels, diamonds and soluble oil 600.00
Maintenance savings per year $3639.60
PRODUCTION OF MACHINE TOOLS INCREASED 3,814 HOURS! This time, evaluated at $5.00 per hour per machine, is in addition to maintenance saving.

Above are significant figures from an actual plant test made recently with Hoffman Flotation equipment. They prove that better and faster machining can be yours at no extra cost! While the Hoffman equipment cuts "down" time, builds quality control and lengthens tool life, it also ACTUALLY PAYS FOR ITSELF in maintenance savings!

You will note that production time is *NOT included in the test saving figure above.* An additional $19,000 was saved by the Hoffman flotation units. Grinders were operated continuously — no "time-out" was needed for cleaning sumps—wheel dressing time was cut. The Hoffman flotation unit delivered clear coolant *automatically.*

Hoffman flotation units *aerate out* solid impurities by a new principle. No filters to change—no strainers to clean . . . entirely mechanical with no added material. For all the money-saving facts, write now.

Completely Automatic
HOFFMAN UNITS
for Coolant Clarification
Write for details



U. S. HOFFMAN MACHINERY CORPORATION
211 Lemoyne St., Syracuse, N. Y.
COOLANT FILTERS • FILTRATION ENGINEERING SERVICE

cially those with the marriage bug) by introducing some method whereby they can have a real incentive to stick by the shop and finish the trade. If there are suitable prospects ahead, the lad's best girl will urge him to stick. If she isn't that kind, the chances are he wouldn't be such a good man in a few years anyhow.

Shops must look beyond direct production by operators to recognize the ability of good all-round men who are necessary to keep production going.

Henry C. Francis,
Clearwater, Fla.

•

Every young person should place learning as a first objective, although learning and earning often conflict. In the case of a young man so situated that he must earn his living and perhaps contribute to the living expenses of one or more dependents wholly or in part, he may for the time being be obliged to sacrifice learning to meet his other obligations. However, learning should be his delayed, but not forgotten, objective.

Every young man should be on the alert for an opportunity to learn and should realize that education secured with difficulty is most beneficial and is building a road leading eventually to greater earning power. The most successful men have not attained their standing easily.

From the employer's standpoint, the grade of help that he can maintain in his plant is to quite an extent dependent upon his foremen, and one of the most difficult places to maintain at its best is the apprentice department. The man in charge of apprentices should be not only well versed in mechanics, but it is especially important that he have a clear manner of expression, good habits and a friendly disposition, together with a natural ability for leadership, or, in other words, someone that the boys know is dependable in all respects and in whom they will have confidence.

Apprentices should be paid their full worth without expecting profit from their labors. If the department at times operates at a slight loss, it will bring to the organization as a whole an asset in high morale, which should be worthwhile.

Abel Blakeman,
Watervliet, N. Y.

•

All people should realize the fact that physically they gain for about 40% of their life span, and that

with **KENT-OWENS**
Milling Machines

No. 2-20
Milling Machine
Table, 42" x 12"
Table Travel, 20"

Today more than ever—production men are depending on Kent-Owens Milling Machines for the *speed* and *accuracy* that keeps production UP and costs down!

These machines are versatile—adaptable to countless milling jobs. They're outstandingly rugged . . . efficient . . . dependable. Designed for easy handling with practical features that shop men like. The Kent-Owens Standard line includes a wide range of hydraulic and hand operated machines.

If you're "floored" by a tough milling problem—call on Kent-Owens! Let our engineers recommend machines and tooling best suited to your requirements. Write us about your needs. Kent-Owens Machine Company, Toledo, Ohio.

YESTERDAY'S PIONEER • • • TODAY'S LEADER

HERE'S A SINGLE ORDER—
48 Large Special
WELDON End Mills

The 48—*Count 'Em!*—48 special large WELDON end mills above represent a single order recently shipped to one of our enthusiastic customers. These are special husky, fast metal-removing WELDON end mills built for sturdy dependable service.

This customer orders in lots like this because he realizes that his profits depend in part on the use of WELDON end mills, noted for their quality, accuracy and fast-cutting performance.

Write for Catalog 8-B

THE WELDON TOOL CO. Cleveland 4, Ohio
3000 WOODHILL ROAD

mentally they grow for about 80% of their life span. Therefore, when they are engaged in purely physical work, they should not reasonably expect further advancement after they pass their peak unless in the meantime they have developed mentally. Improved stability, reliability and practice can give them a standing sufficient to hold them in their present service or even merit advancement.

However, when the service required is mostly mental, their services should be of increasing value to an employer for a much longer span—dependent very largely on the employee's ability to use his knowledge to greatest advantage.

Applying the above reasoning, an employee should be entitled to promotion in proportion to his value until he reaches his peak. Following that period, he should be given work easier to do, and be paid according to his value. This is a time of strain on both the employer and employee. The necessary changes must be made without friction on the part of either —which requires the exercise of judgment, fairness and friendliness.

Demotion is sure to have some effect on the morale of the organization as a whole, and should be resorted to only with the greatest of care. Employers generally do it only of necessity when the situation, if neglected, would cause a loss. Managements must of necessity show some profit, otherwise they likewise deserve demotion.

John Mark May
Watervliet, N. Y.

Torrid Unit Heir Conditioner Hard to Get Out of Whack

Developed originally to produce spontaneous combustion in a woodshed, this device is effective over a large area, but more effective if use is concentrated. It is manufactured by the Hoosier Welt Production Company, Pantzville, Ind., (Population over 00,000). It is hand operated to generate its own heat and is

A DOUBLE SAVING with SCULLY-JONES Style A TAP CHUCKS

① Reduce tap breakage and time lost for changing.

② Speed up production by quick insertion and ejection.

See pages 25, 26, 27, Scully-Jones Catalog No. 500

*In a standard spindle with a Morse Taper Hole

*In Scully-Jones Floating Holder

*In Floating Tension Type Tap Driver for Magic Chuck

*In a Magic Quick Change Chuck

*In a Spring Compression Tap Driver

Universally used for individual or modern mass production, the Scully-Jones Style "A" tap chuck is a one-piece tool designed for driving taps in any type of machine having a spindle, holder or attachment with a Morse taper hole.

True-running, definite stop, positive drive, smaller in diameter than spindle, quick insertion and easy ejection, are advantages that reduce tap breakage and speed up production.

Write for our complete listing of sizes.

5 Big FEATURES

STYLE "A" TAP CHUCKS

1. Drives By Square—a positive drive
2. Centers By Shank—for correct alignment
3. Collet Action—locks tap in chuck
4. Taper Shank—fits any M.T. hole
5. Four Point Bearing—gives collet action

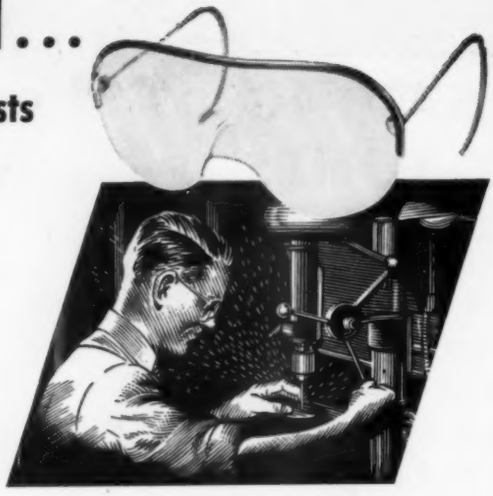
Refer to the Scully-Jones Catalog showing over 500 types and sizes of cutting tools, collet chucks, boring equipment, centers, etc.

Scully-Jones AND COMPANY

1902 SOUTH ROCKWELL STREET • CHICAGO 8, U.S.A.

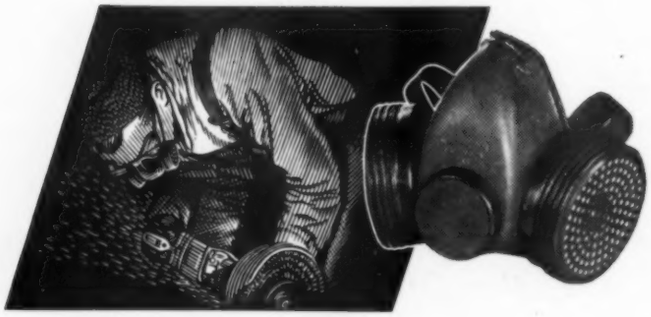
Get WILLSON...

to Change Accident Costs into Safety Savings



PROTECTION IN 9/10 OF AN OUNCE . . . Day long comfort with the Feather Spec*. Large, clear or WILLSON Tru-Hue green, plastic lens gives unobstructed vision.

MOLDED TO FIT A THOUSAND EYES . . . Mirror-smooth rolled edges of the plastic eye cups conform to the contours of the eye cavities for snug, comfortable fit on hazardous jobs. With Super-Tough* lenses.



ALL 'ROUND PROTECTION—ALL 'ROUND COMFORT . . . Metal fumes; chromic acid mists; all dusts—excluded by dual, easy breathing filters and snug fitting facepiece.

For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest Willson distributor or write us direct.

*Trade Mark

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON PRODUCTS INCORPORATED

READING, PA., U. S. A. Established 1870

223 WASHINGTON STREET, READING, PA., U.S.A.

claimed to draw the temper of any blade by means of hard whacks. It leaves the heir, when cooled, in an annealed condition. Its effect is particularly warming on exposed areas. A flexible and form-fitting unit, it removes dust and heats the heir at the point of application, and humidifies by remote control through ducts at the upper end. By raising heir temperature, it lowers the relative temperature. The air is definitely cleared. It has only one moving part, a lithe wand of hickory, which gives the device its name and has the effect of magic. Far simpler in design than electrical units (although it has a built-in switch), it produces its own bellows (and a variety of sound effects—something no other conditioner can provide) and can make itself felt through several layers of cloth or other insulation if necessary. Several sizes are provided, so thickness can be adjusted to the suit, but the bite of any is worse than its bark. Size is measured at the butt. If the seat is kept taut, the heir will be taut as well—in fact, may limp for a time thereafter. Treated heir will be sensitive within a limited area from the conditioner, and immediately following the operation may eat fundamental unless pillow blocks are provided. Successful results are guaranteed if the original formula is followed.

Ed. Note—This formula, first developed by Solomon, whose experience with 300 wives and 600 concubines should give it both reason and authority, is "He that spareth his rod hateth his son." (Proverbs XIII: 24). John Skelton modified it in the 15th Century to " . . . than from theyr children to spare the rod." (Magnyfycence. Line 1954), and finally Samuel Butler put it into familiar form in the 17th Century, viz: "Spare the rod and spoil the child" (Hudibras, Part II, Canto I, Line 843). So the basic idea of their conditioning far antedates Carrier, Jefferson or even George Washington, whose father did some heir-conditioning with a cherry wand, according to Parson Weems.

AUTOMARE

(With apologies to Edgar Allan Poe)

When, upon an evening bleary,
While I toss all hot and weary
And springs come up to punch me
by the score;
My bed, all things but roses,
Deviling him who there reposes,
Starts my mind on that which isn't
—Evermore
All day long I work and wheedle

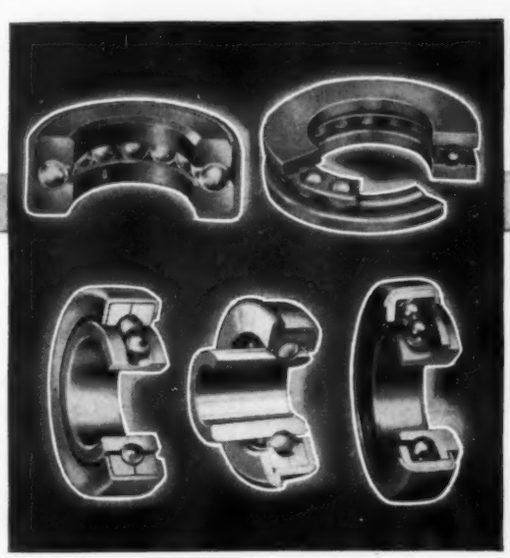
The Chances Are...

IT WILL BE TO YOUR ADVANTAGE TO INVESTIGATE

NICE

BALL BEARINGS

NICE offers, for your consideration, several complete lines of "catalog standards", a few types of which are illustrated. In addition, Nice is tooled to produce many hundreds of "specials", and experienced Nice engineers are prepared to recommend or design the "exactly right" bearing for your application.



NICE BALL BEARING COMPANY Sales Offices are located in Philadelphia, Chicago, Detroit, Dallas, Texas and Charlotte, North Carolina.

Standard catalog bearings are stocked at the factory, and are also stocked by the BOSTON GEAR WORKS, DIVISION THE MURRAY COMPANY, with six branches and ninety distributors located in all principal cities of the United States.

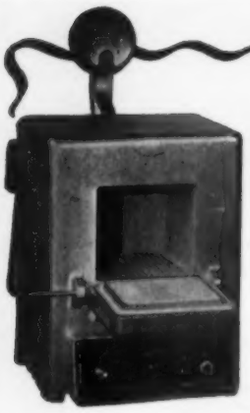
Write for Catalogue No. 125

NICE

NICE BALL BEARING COMPANY
NICETOWN · PHILADELPHIA · PENNSYLVANIA

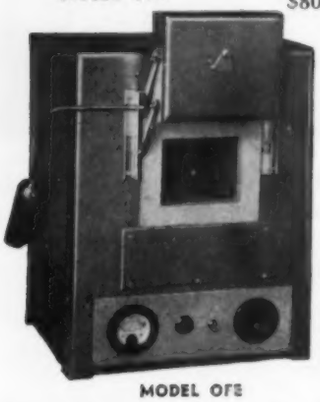
TEMCO

ELECTRIC FURNACES



MODEL CEA

Model CEA is designed to give outstanding performance at low initial and operating costs. Has special high temperature heating element embedded in four sides of muffle lining for protection and uniform heating. Built with TEMCO stepless control which permits operator to select and hold any temperature from 500° to 2000° F. Maintains even temperature regardless of normal changes in line voltage. Heating chamber 4¼"x4¼"x6". Max. input 1.5 kwh. Insulated cast-aluminum body. Supplied with attachment cord ready to plug in and operate. For 115 V. AC $80.00; 230 V. AC $85.00. *Also available for DC.*



MODEL OFE

Model OFE is built for continuous use up to 1600° F, intermittent to 1900° F. Synchronous motor driven input controller permits selection and holding of any temperature from 250° F to maximum. Highest quality nickel-chromium alloy heating element covers four sides of chamber. Steel frame with 4½" insulation. Counterbalanced door opens upward. Muffle chamber 6"x5"x10". Maximum power consumption 2.2 kwh. For 115 or 230 V. AC $194.00.

Models CEA and OFE are equipped with an indicating pyrometer calibrated in both F. and C. scales. They are economical to operate as nearly all the power is consumed within the heating chamber. Ideal for general laboratory uses, heat treating and small unit production.

See your supply house or write for descriptive bulletins

461 W. LOCUST ST., DUBUQUE, IOWA

THERMO ELECTRIC MANUFACTURING COMPANY

PRECISION FEATURES . . . ACCURATE SHEARING

Wysong and Miles No. 1296, 8 Foot - 12 Gauge

with *Wysong and Miles* POWER SQUARING SHEARS

Cut shearing overhead on metals up to 10 gauge with *Wysong and Miles* Power Squaring Shears. Balanced semi-steel construction insures accurate alignment. Precision features cut down shearing time and give accurate work.

COMPENSATING HOLDDOWN
Individual spring activated plunger in each foot firmly clamps full sheets or small strips that come only under one plunger.

PRECISION BACK GAUGE
Ball-bearing, parallel back gauge is quickly adjusted to .0078 (1/128th) of an inch by a handwheel dial reading.

MULTIPLE DISK CLUTCH
Treadle activated friction clutch gives quick pick-up with a minimum jar. Clutch has a non-repeat safety feature.

Other fine Wysong and Miles Squaring Shears in 10, 12 and 14 gauge.
Write for complete information.

WYSONG and MILES Co

623 Fulton Street Greensboro, N. C.

the FINEST in SQUARING SHEARS and BENDING ROLLS

With the camel and the needle
In the shape of metal gargoyles—
spindles four.
Automatics they still call them,
All their long lives they've defied
men,
Now they come to haunt my sleep
—Evermore

In my brain there's clashing,
groaning,
And I hear the damned things
moaning,
As I lay with fevered brow and
fitful snore.
Sure enough, I look around me;
There they are, all pounding
loudly;
But the things that they are making! Nevermore!

The awful rate of their production
Makes me dizzy as I watch them,
And the finished work glows
white-hot on the floor.
Liquid brimstone hot and smoking
Is the coolant—reeking, choking,
But the operator's tail! Oh, Nevermore!

Gleefully he grins and prances
As from pile to pile he dances.
Hefting, testing, as more pitchforks outward pour.
Still not reaching satisfaction
He goes further into action—
Higher speeds and more production—Evermore.

As I lay there, sadly wondering
Which is mine—for earthly blundering,
And the numbers of my friends
who'll share that chore,
I'm becoming slowly conscious
Of a change in all the rumpus,
And calm is slowly settling—
Evermore.

Now the gears, sweet music
making,
Drive the spindles with no
shaking,
For the screw machines are new
without a score.
And they gleam with heavenly
splendor
As the scent they gently render
Rises from ambrosia coolant —
Evermore.

Now my hope's no longer cold
As I watch the tubes of gold
Feeding in through all those collets—four and four!
And the haloes stack on stack
Set my mind at rest, by heck,
And my sleep is peaceful now—
Evermore.

—D. E. YOUTZ

SWANK Eliminates Costly Floor Damage by Mounting Punch Presses on UNISORB

Taylor & Fenn Spring Punch Press

No Bolts • No Lag Screws • No Holes in Floors

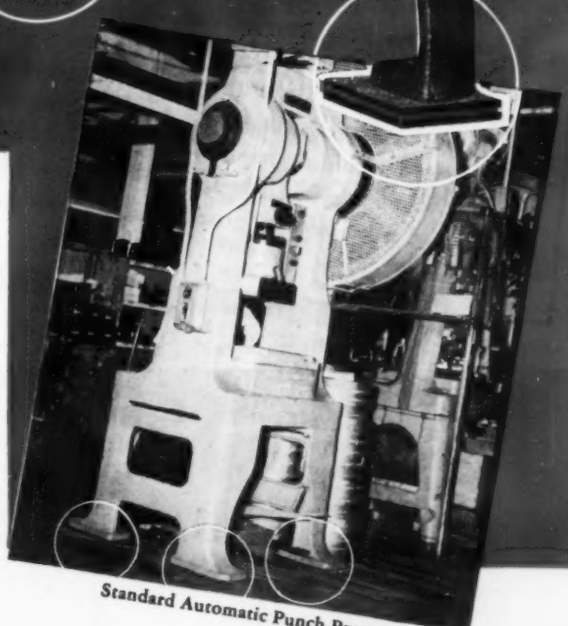
Swank, Inc., manufacturers of distinctive jewelry and accessories for men, anchors punch presses and other vibrating equipment and machinery on UNISORB.

The hole-drilling and floor damage that go with bolt and lag screw mounting are thus eliminated . . . and another manufacturer's valuable floors protected by UNISORB Mounting.

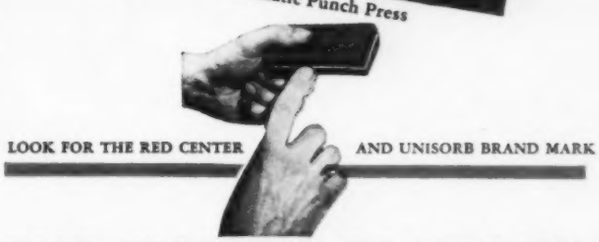
This modern anchoring method is simple, quick and inexpensive. A special cement binds the UNISORB pads to the machine feet and the floor. Permanent set absolutely prevents any riding.

UNISORB absorbs from 60% to 85% of transmitted vibration and noise. This helps you save on machine repairs and building maintenance, helps you provide employees with quieter surroundings — and helps them work more efficiently.

Send for sample and complete specifications.



Standard Automatic Punch Press



LOOK FOR THE RED CENTER AND UNISORB BRAND MARK

Writes Swank, Inc.: "We are satisfied users of UNISORB, which we are using for anchoring power presses, automatic stamps, foot presses, exhaust blowers, dryers, tubbing equipment and motors. We have applied UNISORB to wood and cement floors, and also to tile. We do not hesitate to recommend UNISORB for the uses to which we have put it.

THE FELTERS COMPANY

210-N SOUTH STREET, BOSTON 11, MASSACHUSETTS

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Southwest Representative: Textile Supply Co., Dallas, Texas
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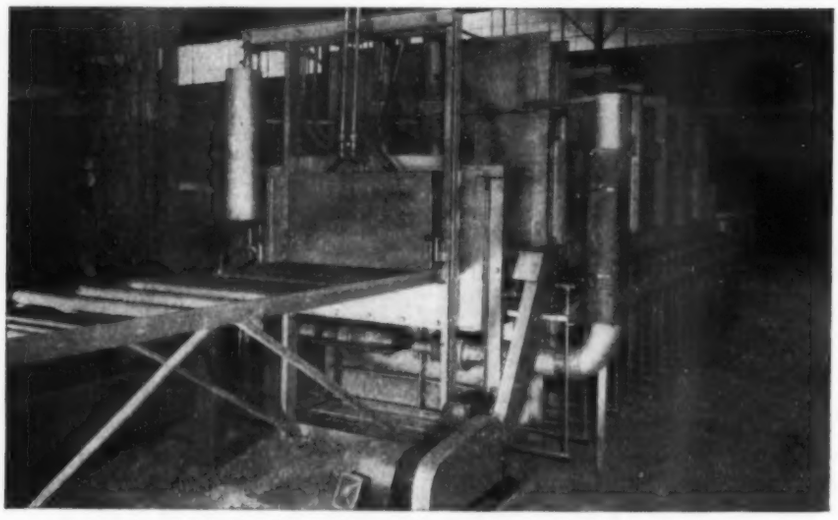
For High Temperature Conveyor Lubrication—Dag is the Doctor

FOR EXAMPLE:

(1) Conventional lubricants carbonized quickly, flaked off, when used on a 275-foot conveyor carrying porcelain through an 1800° F. kiln. Result: a jerky, inefficient, costly operation requiring practically constant lubrication. Remedied speedily by application of a "dag" colloidal graphite sprayed on hot bearing surfaces. The fluid carrier evaporates instantly, leaving a dry lubricating film of graphite which performs smoothly, with reduction in wear and power consumption. (2) A suspension of "dag" colloidal graphite in kerosene to lubricate a conveyor in a foundry core oven replaced a powdered graphite in kerosene. Result: an application every 60 days instead of every 3 or 4, with no worries or insecurities about conveyor chain operation; and of course substantial savings in lubrication costs. Complete details on these two case histories, and many more, are available.

There are scores of uses for "dag" colloidal graphite. For extreme temperatures, where ordinary lubricants burn or evaporate or flake off, or where special petroleum lubricants need reinforcement, "dag" colloidal graphite will retain full efficiency at temperatures from 300° to 3000° F.



Furnace manufactured by Gas Machinery Company, Cleveland, Ohio

Other APPLICATIONS FOR "dag" colloidal graphite:

- drawing magnesium ☐
- kiln car lubrication ☐
- forging lubrication ☐
- high temperature bearing lubrication ☐
- drawing steel wire ☐
- glass molds ☐
- permanent molds ☐
- curing rubber tires ☐
- assembly of mating parts ☐
- run-in of new mechanical equipment ☐
- permanent lubrication in electrical appliances ☐
- dry film lubrication ☐
- chill coating in foundries ☐

Check Your Interest and Mail Today

AA15

dag COLLOIDS

Acheson Colloids Corporation, Port Huron, Michigan

THE FIRST NEW IDEA IN DRILL JIG BUSHINGS... SINCE HECTOR WAS A PUP!

MEYCO Carbide-Inserted Drill Jig Bushings Cost a Little More, But Last Much L-o-o-onger!

● Will these bushings save you money? Will they cut production costs? Figure it out yourself: Actual field tests have shown that Meyco bushings with the carbide inserts outlast cast alloy, high speed steel and standard carbon steel bushings by 10 to 50 times . . . yet their cost is approximately 6 to 10 times that of ordinary bushings.

But that's not all the savings! Meyco Carbide-Inserted Drill Jig Bushings will increase the life of drill jigs and fixtures, reduce non-productive machine time and non-productive man-hours, save on spoilage, save on inspection time and increase drill and reamer life.

And finally, no change is necessary in drafting room or tool design. Made to ASA standards, you can start using them right away.

For details, further information and price schedule, write today for Meyco Bushing Catalog No. 11.

W. F. MEYERS CO., INC., BEDFORD, INDIANA

LIGHT THE VITAL SEEING ZONE *with* LOCALITES

"FIRST FOR SEEING"

The primary function of industrial lighting is to illuminate the worker's task so that he can see quickly, accurately and comfortably all details of his operation. The better his seeing tool — the higher is his efficiency. Only with localized lighting units can the proper quantity of illumination be focused on the immediate work area of each operation according to the seeing requirements of the worker for his particular task. In combination with a proper proportion of general overhead lighting, to avoid too wide a contrast between the illumination of the immediate work area and the surrounding area, the result is Balanced Lighting — planned lighting at its BEST.

• *Improves* PRODUCTION —CUTS COST

MODEL 3470-P-172

Used for large presses, milling and boring machines. Also assembly and inspection benches. Overall length 45½". Three joint adjustable. Circular base for 3-screw mounting.

In excess of 200 footcandles.

$61.11 COMPLETE *(Net Industrial Price)*

MODEL 32-H-174

Recommended for small machine tools, lathes, punch presses, etc. Overall length 23¼". Two joint adjustable. Flat oblong base for screw mounting.

In excess of 175 footcandles.

$43.31 COMPLETE *(Net Industrial Price)*

MODEL 3267-C-172

Used for machine tools, assembly, inspection, and instrument repair work. Overall length 32¾". Three joint adjustable. Circular base for 3-screw mounting.

In excess of 200 footcandles.

$58.89 COMPLETE *(Net Industrial Price)*

FOSTORIA LIGHTING EQUIPMENT AVAILABLE THROUGH SELECTED WHOLESALERS FROM COAST TO COAST

- Write for folder on "How to Plan Your Lighting" and complete selection of Localite models.

THE FOSTORIA PRESSED STEEL CORP.

FOSTORIA, OHIO, U. S. A.

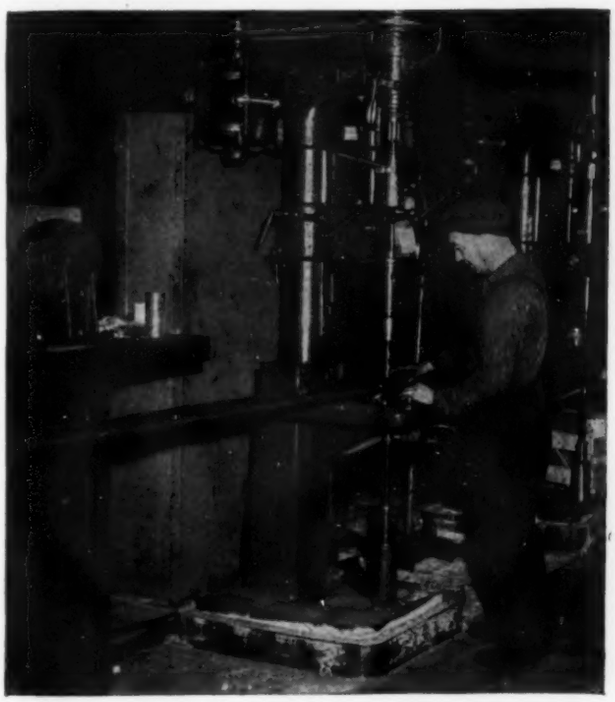
In Canada:
Amalgamated Elec. Corp. and all Northern Electric Branches

BALANCED LIGHTING
fostoria
GENERALITES for Overall Lighting • LOCALITES for Light ON the Job

Trade Mark
Reg. U. S. Pat. Off.

FOR LOWER MANUFACTURING COSTS

"Easy TO Handle as a Small Drill"

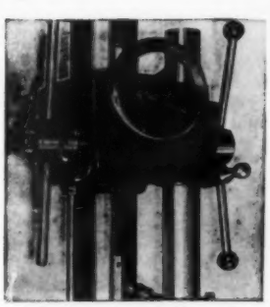


—YET HAS 2" CAPACITY IN CAST IRON!

— 1½" IN STEEL!

That's what users say about these mighty "Buffalo" No. 22 Drills! Ninety-seven inches high and with spindle 1.312" in least diameter, the No. 22 handles as easily and fast as a production drill on light work. Speeds are readily changed (65 to 1350 rpm on 1200 rpm motor). Quickly altered for different setups in drilling or tapping. Sensitive or power feed. Controls where you can reach them. Simple lubrication. No wrench adjustments required.

WRITE NOW for bulletin 2989-E— see how the "22" can help you.



Above, pull-down power feed handle enables quick shifts from sensitive to power feed. Available with "Buffalo" No. 22 Drills.

BUFFALO FORGE COMPANY

509 BROADWAY BUFFALO, N. Y.

CANADIAN BLOWER & FORGE CO., LTD., KITCHENER, ONT.

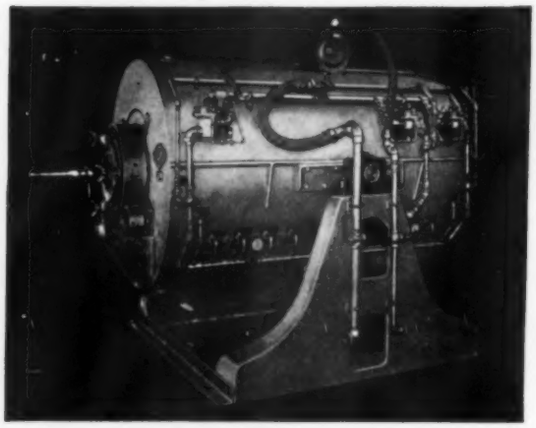
MACHINE TOOLS by "Buffalo"

- ★ BACK SPOT FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END PUNCHES AND SHEARS
- ★ LOCOMOTIVE SHEARS
- ★ MILL TYPE SHEARS
- ★ RAPID ACTING PUNCHES
- ★ SINGLE END SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL IRON WORKERS
- ★ UNIVERSAL IRON WORKERS
- ★ DRILLS FOR THE PRODUCTION LINE DRILLS FOR THE TOOL ROOM

CONTINUOUS SERVICE—FASTER OPERATION—PEAK ACCURACY

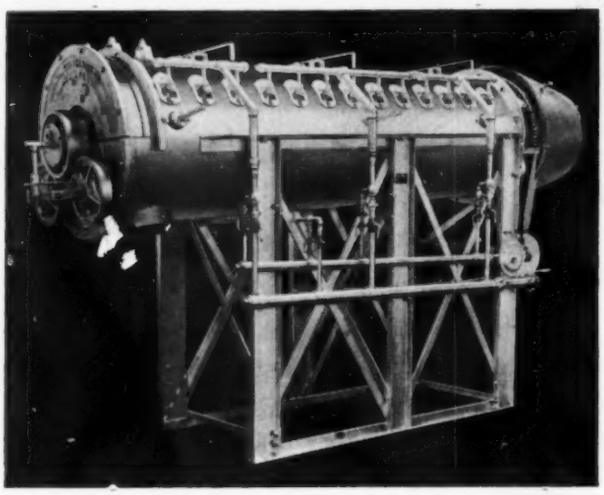
Pioneers IN HEAT TREATING EQUIPMENT SINCE 1878

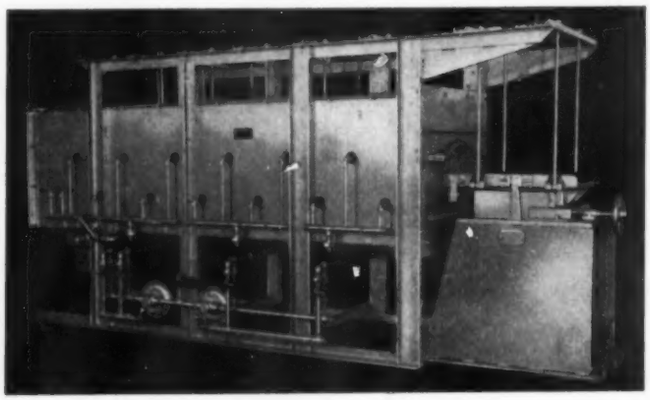
VERSATILE EQUIPMENT WHICH CAN BE USED WITHOUT MODIFICATION FOR CLEAN HARDENING, NORMALIZING, CARBURIZING, CASE HARDENING BY THE PATENTED "NI-CARB" PROCESS, AND OTHER TYPES OF GENERAL AND ATMOSPHERE WORK.



ROTARY GAS CARBURIZERS. Work uniformity is assured by gentle mixing of work produced by rotary action of retort, which is heated by numerous carefully distributed and balanced burners. Carburizing or atmosphere gas is introduced through a simply-designed, trouble-free connection. Charging and discharging of the work is accomplished by means of a tilting feature, which is power driven on the larger model. The retort remains within the heat at all times. Maintenance and handling of carburizing boxes are completely eliminated. Our No. 4 Rotary Gas Carburizer illustrated at the left, has an operating capacity (2/3 full) of about 18,500 cubic inches—one of four standard sizes.

ROTARY CONTINUOUS FURNACES. Work heat treated in these furnaces ranges from small pins and bearing parts up to heavy forgings for universal joints, which are normalized in the larger rotaries. These furnaces also find application in the process industries for calcining carbonates and nitrates, burning, garnet grain, and similar processes. Uniform heating is assured by the gentle mixing of the work as it passes through the rotating retort. Speed of rotation is controlled by a variable speed transmission, permitting quick and exact adjustment of the time-temperature cycle. Atmosphere control is complete and positive, assuring uniform, easily duplicated results at all times. The atmosphere gas is introduced through a simply-designed, trouble-free connection. Long retort life is assured by the fact that it remains within the heat at all times. Only work enters and leaves the furnace. Economical operation is secured by the thick lining of insulating refractory, backed by block insulation. Firing by means of many small burners keeps fuel efficiency high, heat losses low. The furnace illustrated at the right is our No. 139-M Rotary Furnace, which has a capacity of 500 to 1000 lbs. per hour depending upon the work—one of five standard sizes.





RECIPROCATING, ATMOSPHERIC CONTROLLED FURNACES. Among users of this type furnace are manufacturers of bearings, screws, lock washers, tools, wrenches, flat and coil springs, steel writing pens, and many others. Commercial heat treaters favor Reciprocating Furnaces because they are able to handle the many varied and different jobs daily received in a general heat-treating shop. The reciprocating muffle advances the work through the heat by its own momentum. The complete elimination of conveying mechanism from the heating chamber reduces maintenance problems and heat losses to a minimum. There is no traveling belt to be alternately heated and cooled—only work enters and leaves the furnace. The furnace illustrated at the left is our No. 191-B Reciprocating Furnace, having a capacity of 300 to 600 lbs. of work per hour—one of five standard sizes.

AMERICAN GAS PIONEERS 1878 FURNACE CO.

Write for detailed literature on these furnaces and other types of heat treating equipment.

AMERICAN GAS FURNACE CO.

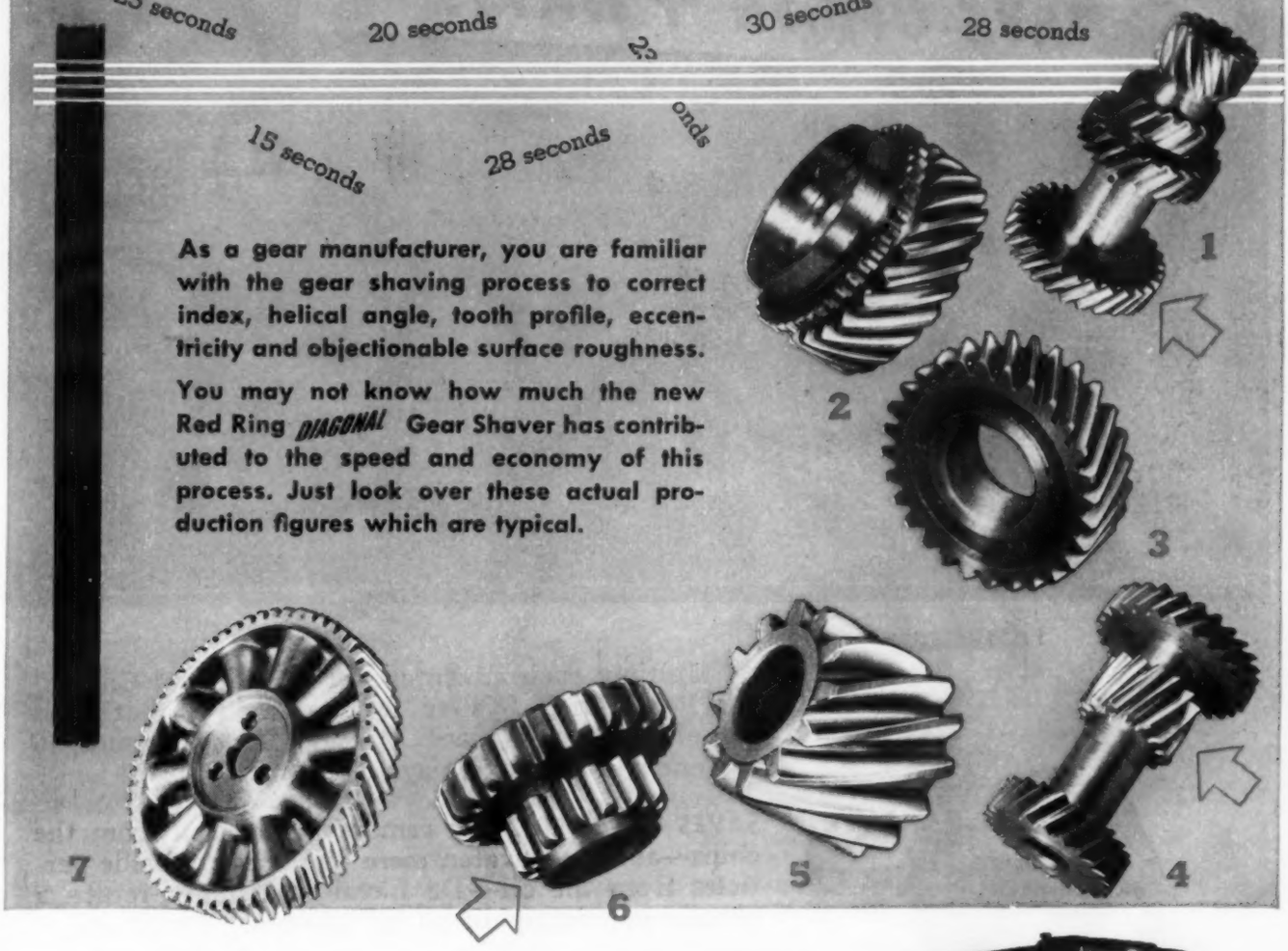
1000 LAFAYETTE STREET, ELIZABETH B, N. J.

Actual Gear Shaving Production Figures

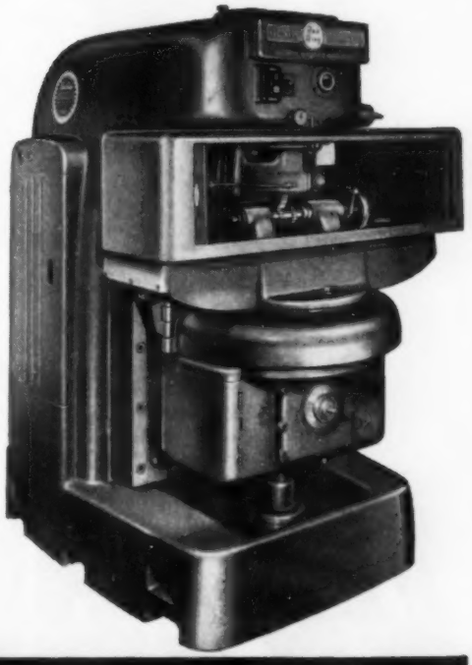
15 seconds · 30 seconds · 12 sec · 23 seconds · 12 seconds · 25 seconds · 20 seconds · 30 seconds · 28 seconds · 15 seconds · 28 seconds · onds

As a gear manufacturer, you are familiar with the gear shaving process to correct index, helical angle, tooth profile, eccentricity and objectionable surface roughness.

You may not know how much the new Red Ring *DIAGONAL* Gear Shaver has contributed to the speed and economy of this process. Just look over these actual production figures which are typical.



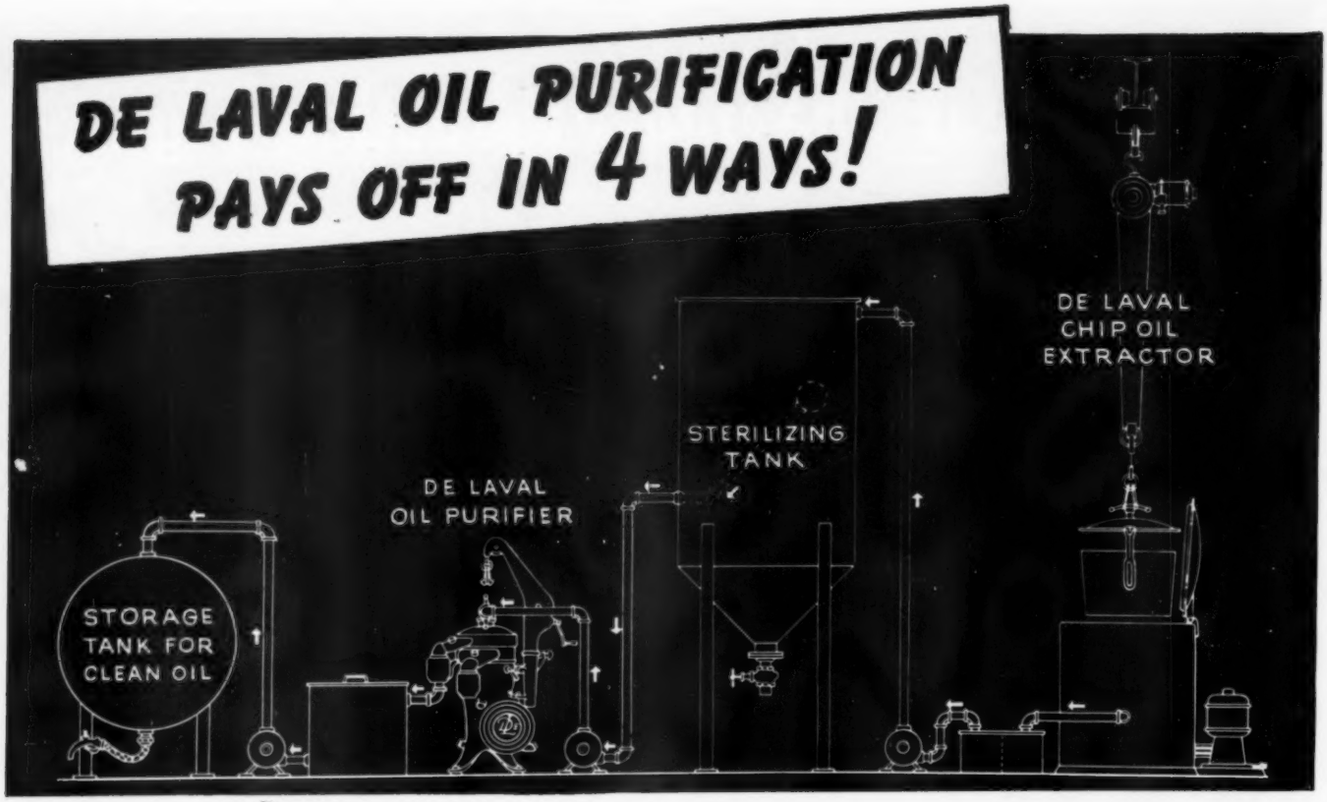
Gear	Material	Dia.	Face	Teeth	DP	Stock Removed over Pins	Machine Time
1	Steel	4″	11/16″	29	9.25	.010″	30 seconds
2	Steel	3 5/16″	1″	23	10.5	.010″	23 seconds
3	Cast Iron	2 5/16″	1 1/16″	28	10	.010″	20 seconds
4	Steel	2 1/4″	1 3/8″	14	7.6	.009″	28 seconds
5	Steel	1 1/8″	1″	12	13.5	.005″	9 seconds
6	Steel	2 9/16″	11/16″	14	6/8	.006″	15 seconds
7	Aluminum	6 1/2″	1″	56	10	.010″	25 seconds

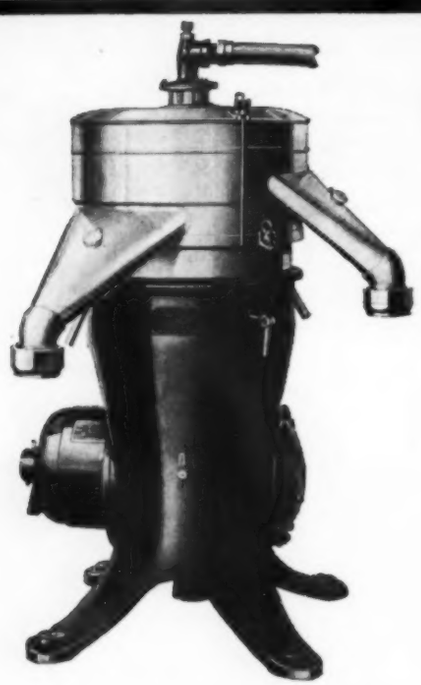


For further information write for Bulletin S47-3 or, better still, consult a Red Ring Engineer.

NATIONAL BROACH AND MACHINE CO.
5600 ST. JEAN · · · · · · · DETROIT 13, MICHIGAN

DE LAVAL OIL PURIFICATION PAYS OFF IN 4 WAYS!





A De Laval Oil Purification System designed for your specific needs will pay off in dollars and cents savings in your plant. Get details in Bulletin FC-5.

Multiply each advantage of a De Laval Cutting Oil Purification System by the savings that each can effect in your plant. A typical system, such as the one shown above, pays off in many ways:

SAVES OIL COSTS! By removing more oil from the chips—and ***more*** water, ***more*** dirt, ***more*** metallic particles from the oil—De Laval centrifuges return a greater percentage of oil in "like-new" condition.

GETS GREATER ACCURACY! Plenty of De Laval-purified cutting oil insures faster, smoother cutting, results in consistent accuracy and less machine "down time" caused by chips and abrasives.

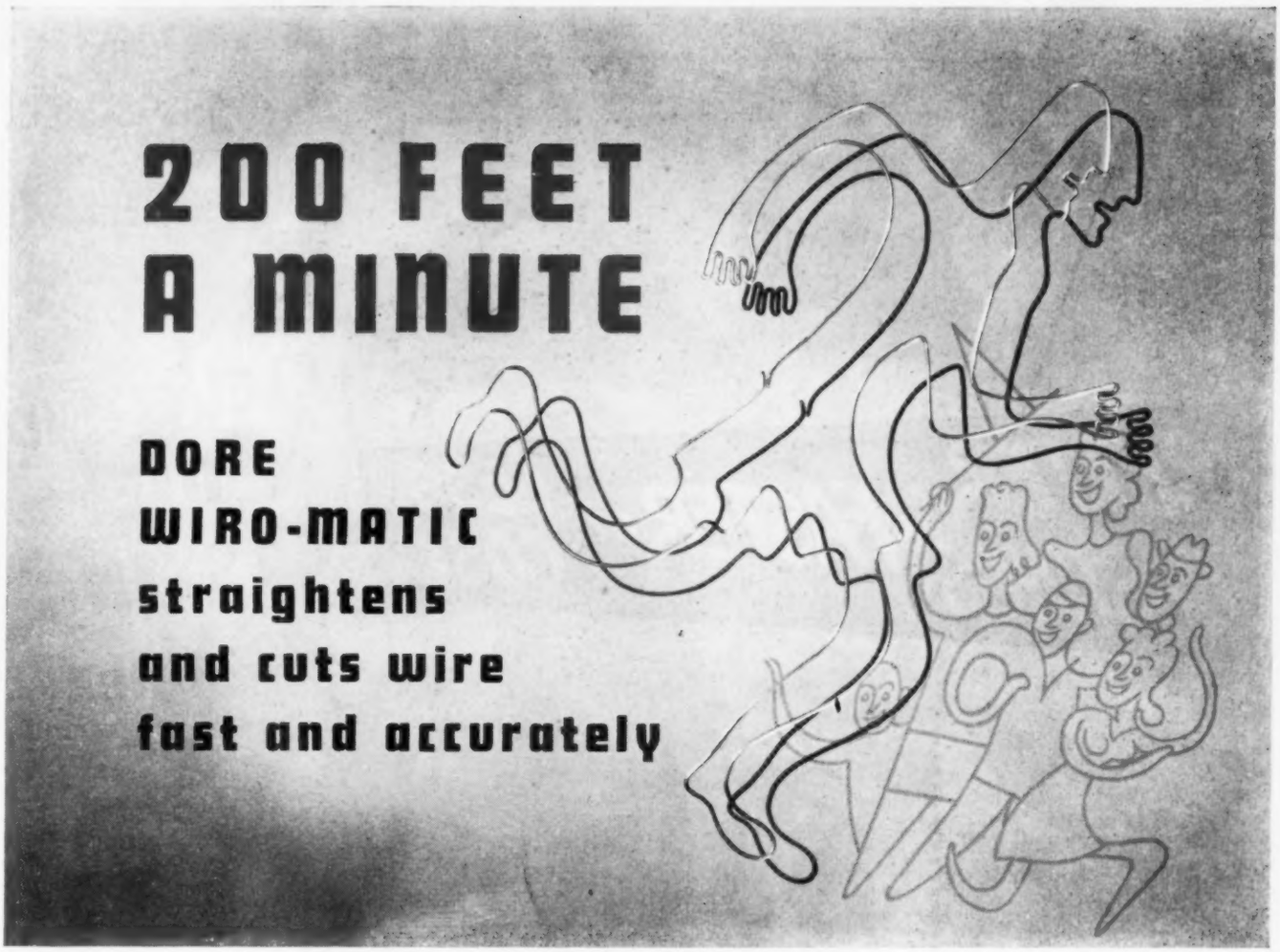
PROLONGS TOOL LIFE! "Loaded" cutting oils quickly dull tools, even cause momentary interruption of cutting action. A De Laval system has in many cases been responsible for doubled tool life!

REDUCES DERMATITIS! A complete De Laval system includes positive sterilization and purification that greatly reduces the causes of dermatitis!

DE LAVAL

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 19
THE DE LAVAL COMPANY, Limited
PETERBOROUGH
QUEBEC MONTREAL WINNIPEG VANCOUVER

PURIFIERS AND CLARIFIERS FOR FACTORY OILS



Talk about speed—a Dore WIRO-MATIC straightens and cuts wire clean and square from 6″ to 20′ in length within a tolerance of plus or minus .005″ at the rate of 200 feet per minute! And here's why:

Micro-switch and solenoid actuates clutch instantly. High-speed Dore clutch engages six times faster than ordinary clutch Cut-off knife cuts on both forward and reverse stroke. Double-grooved shuttle-bar slides to receive new stock at the same time old stock is being cut off and discharged. Flow of wire is virtually continuous.

Spinner dies in plain view and accessible for adjustment. Reversible double-grooved feed rolls. Steel core V-belts. Welded steel construction. Dies adjustable for every type wire.

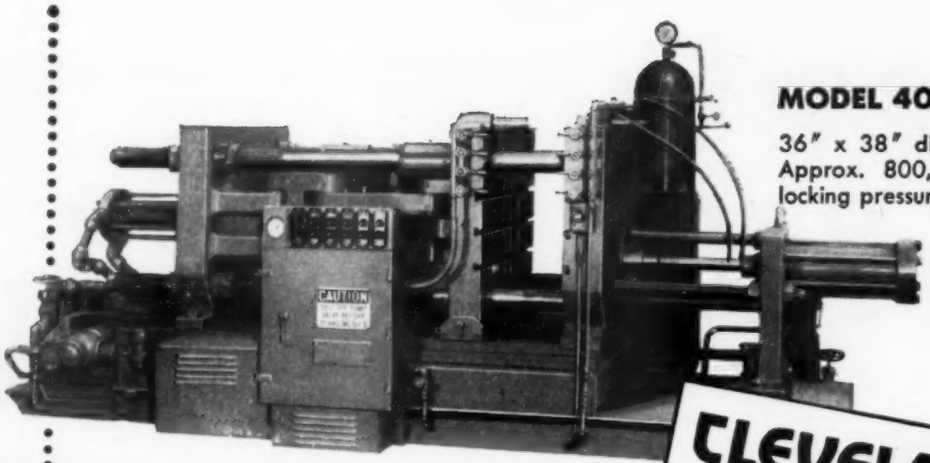
Three Dore WIRO-MATIC Models available on 30 to 60 day notice. Model A for wire .040″ to .156″ dia., Model B for wire .120″ to .250″ dia. and Model C for wire .120″ to .312″ dia.

Write today for copy of Dore catalogue of WIRO-MATICS, reels, wire trucks, and special wire working machinery.

DORE WIRO-MATIC

STRAIGHTENING AND CUT-OFF MACHINES

GRAYLING, MICHIGAN

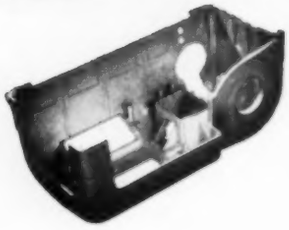


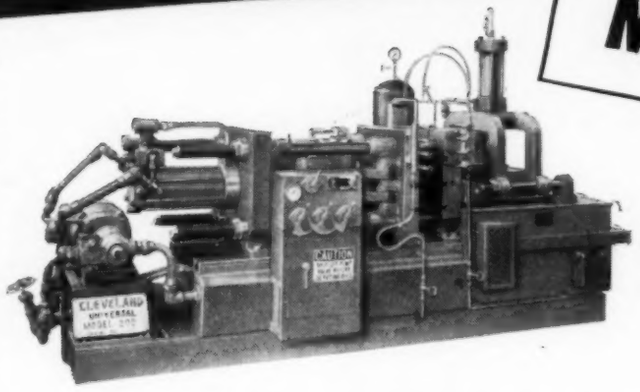
MODEL 400

36″ x 38″ die plates. Approx. 800,000 lbs. locking pressure.

BETTER CASTINGS → FASTER at LESS COST

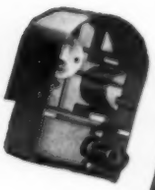
CLEVELAND DIE CASTING Machines





MODEL 200

27″ x 27″ die plates. Approx. 400,000 lbs. locking pressure.



Here are two universal high-pressure hydraulic die casting machines, *Cleveland-Built* for high production of quality castings. Heavy, rigid construction—welded, flame-cut steel plates—resists shock and strain, prevents stretch and distortion. Dies are held in accurate alignment, producing precision castings with minimum flash.

Cleveland design gives you easy access to dies; ample die area; sure-fire shot mechanism; flaw-proof quality of hot metal; rapid and positive core pulling and ejection; safe and simple control—either manual or full automatic. Simply changing hot metal ends converts both Cleveland models from zinc, tin or lead casting, to aluminum, brass or magnesium casting.

With both models working as your casting production team, Cleveland engineering further reduces costs. Construction on both models permits the maximum amount of interchangeability; platen and die plate T-slots are identical in size and location; goosenecks, nozzles, plungers, sleeves, etc., are interchangeable.

Let a Cleveland engineer show you the advantages these machines can bring to your die casting production. Send us details of your work. For complete machine specifications, write for bulletins.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

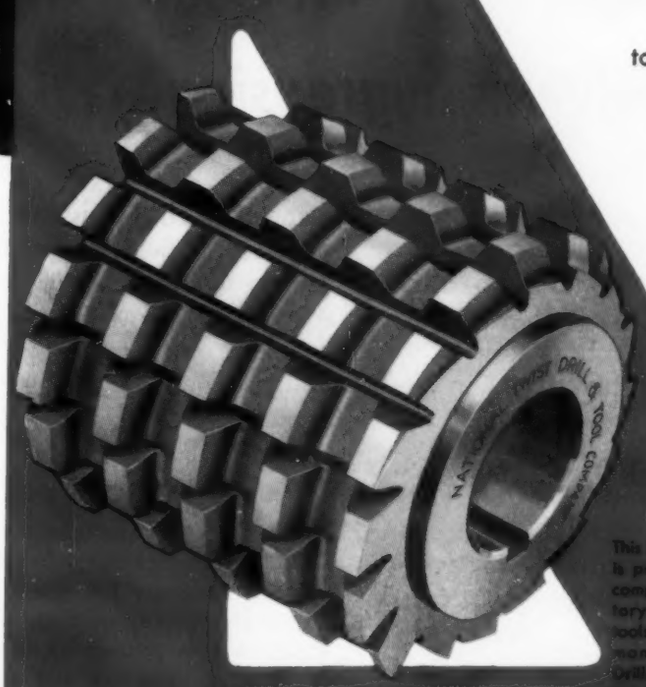
4928 BEECH STREET • • CINCINNATI 12, OHIO

CHICAGO (6) 3710 Civic Opera Bldg. CLEVELAND (14) 1114 NBC Bldg. DETROIT (2) 540 New Center Bldg.
HARTFORD (1) 529 Capital National Bank Bldg. NEW YORK (6) 2402 Singer Bldg.

PERFORMANCE IS BUILT INTO NATIONAL METAL CUTTING TOOLS

ENGINEERING *by Design*

Here at National, engineering design is based on practical field experience. National field engineers continually make performance tests, on every kind of material and under all conditions. In the modern, fully-equipped National laboratories, these tests and this experience are translated into concrete tool design. When you specify National rotary metal cutting tools, you get tools that incorporate all of the latest advances in the art of metal cutting.



This Spline Shaft Hob is part of National's complete line of rotary metal cutting tools. National also manufactures Twist Drills, Reamers, Milling Cutters, Counterbores, End Mills, and Special Tools.

Call Your Distributor

LEADING DISTRIBUTORS EVERYWHERE offer complete stocks of NATIONAL Cutting Tools. Call them for cutting tools or any other staple industrial product.

NATIONAL TWIST DRILL AND TOOL COMPANY

ROCHESTER, MICHIGAN, U. S. A. Tap and Die Division — Winter Bros. Co.

Distributors in Principal Cities • Factory Branches: New York • Chicago • Detroit • Cleveland • San Francisco

Key piece in solvent degreasing

Distributors of Du Pont Degreasing Solvents are located in important manufacturing cities, within easy call from your plant. Backing up their efforts are the Du Pont Technical Representatives. They are available, on short notice, to work with you, to be of service to you in degreasing applications.

If things aren't working out the way you think they should . . . if you feel that your solvent losses are too high . . . that you're not getting the best results from equipment or solvent . . . or you have some question about how to handle and use the solvent . . . just call or write to the nearest Du Pont distributor. And you'll get a competent man, thoroughly familiar with degreasing, a man who will help you come up with the answer to your problem. If field tests don't provide a quick answer, there's a supporting group of engineers, chemists and specialists, research and laboratory facilities in Niagara Falls to fall back upon for even more help.

★ ★ ★

ABOUT DU PONT DEGREASING SOLVENTS

Under various trade names, Du Pont Trichlorethylene and Perchlorethylene solvents for metal cleaning have been in wide use for many years. They are the best Vapor Degreasing solvents we've ever made—the best we know how to make. Use them with complete confidence and assurance for all metal degreasing work. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

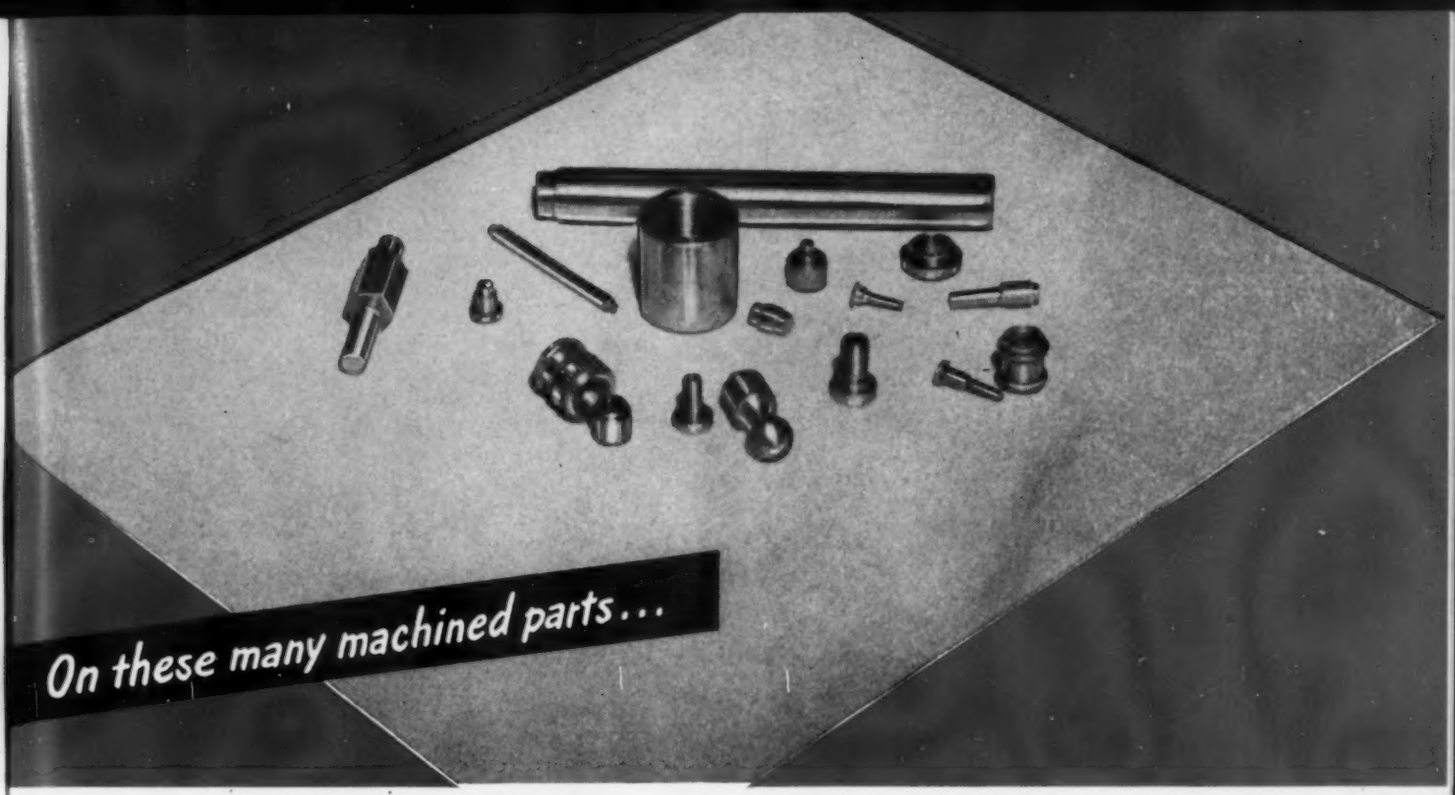
Tune in to Du Pont "CAVALCADE OF AMERICA," Monday nights—8 p. m. EST, NBC

DU PONT SOLVENTS for VAPOR DEGREASING

SOLD NATIONALLY THROUGH DISTRIBUTORS

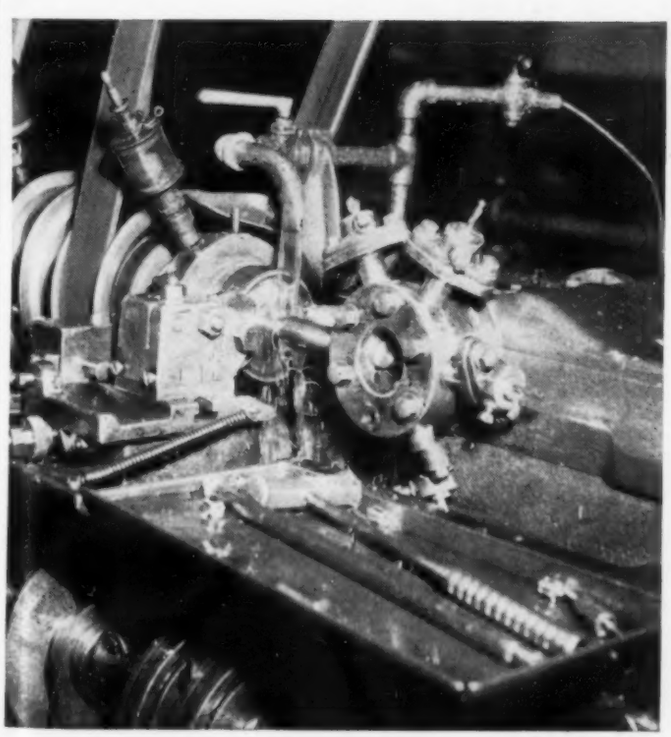
DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



Good Finishes, Close Tolerances, Low-Cost Production with . . .

Stanicut



A midwest machine job shop wanted a cutting oil to give smooth, accurate finishes on a wide variety of machined parts. They preferred a light-colored oil through which machine operators could read their "mikes" and check the finishes.

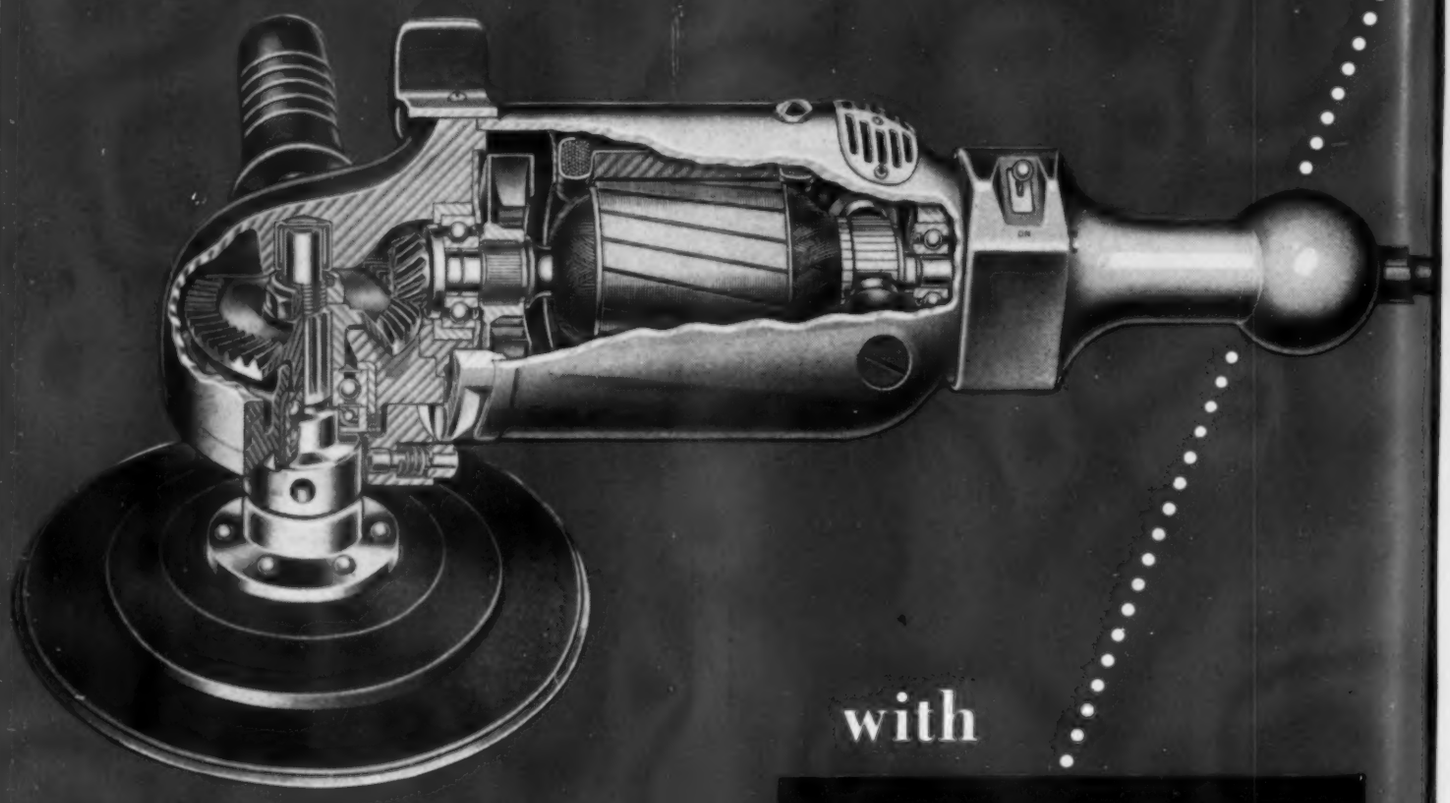
Stanicut 107 BC was the versatile cutting oil they found to meet these demands. It permitted fast, accurate machining and produced high finishes on all parts.

Stanicut 107 BC is successfully used on a large variety of the shop's machining jobs, including threading, turning, drilling and reaming operations. The wide use of Stanicut saved stocking of costly, special cutting oils—eliminated time-taking oil changes on machines.

A Standard Oil Cutting Oil Specialist will be glad to help you apply this cost-cutting oil to operations in your shop. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

Solved: high-speed gear lubrication problem .....



with

Calumet
Viscous Lubricants

Shown above is a cut-away view of the portable, electric sanding tool produced by a midwest manufacturer. Armature pinion has a no-load speed of 17,000 RPM. Tool spindle gear travels at 4500 RPM. Before a Calumet Viscous Lubricant was used, grease breakdown prevented satisfactory lubrication of gears and bearings.

VARIOUS GREASES were tried in electric sanders and polishers manufactured by a midwest company. But the high speeds of the spiral bevel gears in these tools caused the lubricants to break down and separate into oil and base components. The oil leaked out and the remaining base material provided no lubrication.

In 1945, the recommended grade of Calumet Viscous Lubricant was tested. Its excellent stability eliminated separation at all speeds and loads. As a result, this unique grease was put in all sanders and polishers produced by the company. Now, when tools are returned for routine checking after a year or more of service, they are found to be properly lubricated ... with gears in good condition.

A Standard Oil Lubrication Engineer will be glad to help you solve the grease problems of your plant. Write Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

Osborn brushes scrub steel strip to produce top quality tinplate faster

BRUSHING PERFORMS IMPORTANT SERVICE IN CARNEGIE-ILLINOIS ELECTROLYTIC TINNING PROCESS

PICTURED above is one of three electrolytic tin mills operating around the clock at the Irvin Works of the Carnegie-Illinois Steel Corporation. And, from the inception of this process Osborn Brushes have performed a vital function in the continuous production of quality tinplate.

Located at the point in the line indicated by the arrows are two Osborn Master Tampico Spiral Brushes between which the strip passes after emerging from a sulphuric acid bath. Purpose of bath is to remove annealing scale and soften any grease or dirt adhering to the surface. The brushes' task, with the aid of a 180° hot water spray, is the final removal of the grease and dirt particles.

It's an all-important brushing job because failure to remove particles results in a porous coating. And comprehensive tests have shown that Osborn Brushes not only perform this work more effectively but reduce down time because of their one-third longer service life.

Have you a cleaning, polishing, roughing, finishing or deburring job that poses a production problem? The right brush, properly applied may be the answer. And you can find out quickly. Just ask for the services of an Osborn sales engineer. His business is to find where brushes can fit into your business profitably.

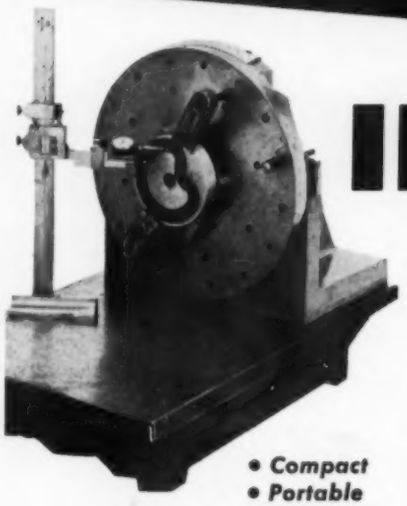
Osborn Brushes

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue — Cleveland, Ohio

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

NOW A NEW ERA IN INSPECTION
...The Sine Bar is Dead!



CLEVELAND REPUBLIC

INDEXMASTER

For Fast, Accurate, Low-Cost Precision Inspection

Here's the answer for speed combined with accuracy and precision in inspection. So simple that even a semi-skilled mechanic can perform the most critical inspection operation in *a fraction of the time* normally required. The Indexmaster provides the utmost in faster inspection, greater output and reduced costs.

- ***Compact***
- ***Portable***
- ***Ready for Instant Use***

ELIMINATES the Sine Bar in inspection operations.
CHECKS angles with standard "Jo" Blocks.
SPEEDS layout of cams, jigs, fixtures, gauges, etc.

Ask your distributor for full information—or write the address below.

CLEVELAND REPUBLIC TOOL CORPORATION

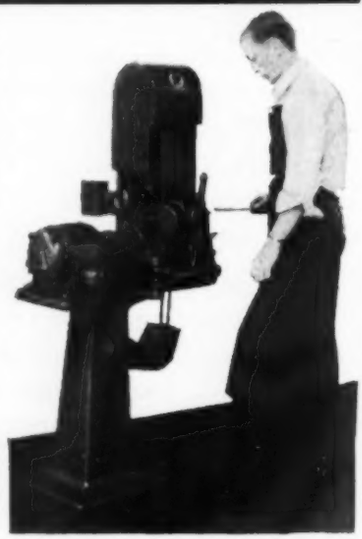
Sales Office: **1265 UNION COMMERCE BLDG., CHerry 1937** • ***Main Plant:*** **9615 MEECH AVE., Diamond 7300**

CLEVELAND, OHIO

THE "PRODUCTION" TYPE S CENTERLESS GRINDER
ideal for cylindrical polishing or straight line finishing

Even in the hands of inexperienced operators, this machine assures a high speed, fine, uniform finish. It will handle cylindrical work up from ¼" to 1" diameter automatically by means of Centerless Feed Attachment, no centering or chucking being required.

The Type S Machine can also be used for straight line finishing of flat work by hand manipulation. The flat surfacing bed is quickly removable, leaving the abrasive belt flexible for finishing irregular shapes.



SPECIFICATIONS

Abrasive belt—4" wide, 60" long
Motor 1 H.P., 1750 R.P.M.
Belt Speed—3200' per min.
Dist. table to floor (Horizontal position) 36"
Table—4½" x 13½"
Ball Bearing equipped

Write for illustrated literature giving full details.

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MACHINE COMPANY GREENFIELD, MASSACHUSETTS, U.S.A.

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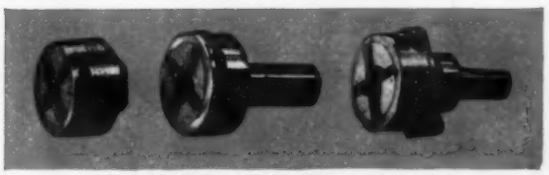
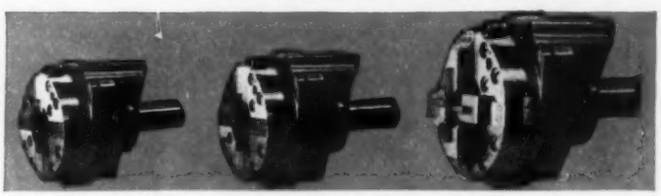


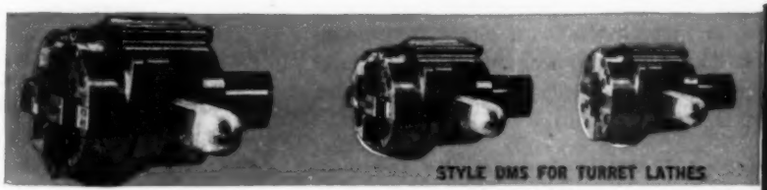
SOLID ADJUSTABLE DIE HEADS

H&G Insert Chaser DIE HEADS



STYLE DM FOR B & S AUTOMATICS, ETC.

STYLE MM FOR MULTIPLE SPINDLE AUTOMATICS



STYLE DMS FOR TURRET LATHES

H & G GENERAL PURPOSE DIE HEADS use the famous H & G Hobbed (Tapped) Chasers that fit the thread like a nut fits a lead screw. The helix is correct at all points of contact — the major, minor and pitch diameter. It is the only chaser to meet such requirements — the only really true chaser made. Heads for all machines.

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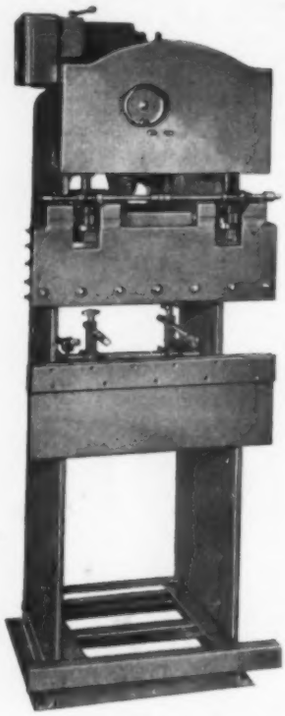
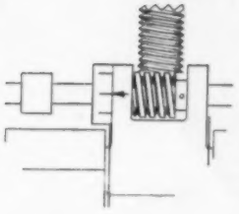


NEW . . . . .
24" ALL-STEEL WELDED
PRESS BRAKE



Note cut of micrometer dial, making possible adjustments of one thousandth. Easily disengaged coupling allows fast ram parallel adjustment. Speed is infinitely variable within its range. Dry disc clutch easily, quickly adjusted without wrenches.

A new press brake to satisfy the growing demand for a smaller, less expensive machine, has been developed by Knight Machinery Company, 1001 S. Delaware Street, Indianapolis 2, Indiana. Identified as the 24-inch all-steel, welded Press Brake, this small press is sturdily built and is designed for smaller jobs. In this way larger and more costly equipment can be released for other work. Features of the new Knight Press Brake include heavy welded construction, conveniently placed switches and speed control handle, enclosed moving parts (except ram) between the uprights and a capacity ranging up to 18 gauge x 24" over 90° die. The Press Brake operates at speeds from 19 to 67 strokes per minute and occupies a floor space of only 30" x 24". The height is 69" over the motor and weighs only 1000 lbs. when skidded. Extra equipment is also available and consists of front operated gauges, extra width platen, light behind ram, dies and casters for easy moving.

Hand wheel for speed adjustment and indicators for extreme ram positions.

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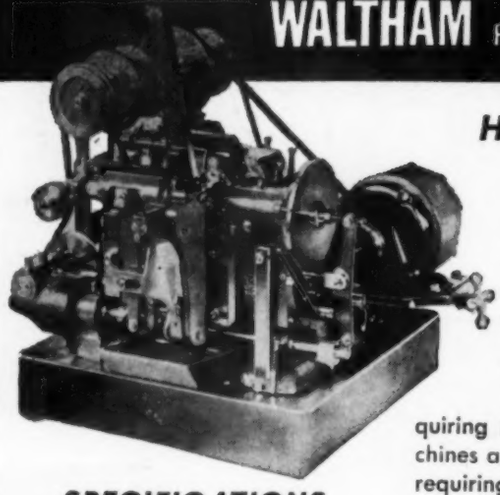
WALTHAM PINION & GEAR CUTTING MACHINES



Highly productive—fast and accurate

These machines—made in single-cut, multiple-cut and magazine-feed types—are designed for the fast, precision production of gears and pinions for watches, instruments, fuses, etc. They are simple to operate, requiring no special skill. Magazine-feed machines are fully automatic, the other machines requiring positioning of blank and starting by hand.

Drive for these machines is either from countershaft or by individual motor. On motor driven machines, V-belts drive cutter spindle, worm shaft and pump.

Illustrated literature and detailed specifications are available promptly on request.

SPECIFICATIONS

PINION MACHINES

Diameter capacity, approx. ½"
Coarsest pitch about 32 D.P.
Strokes of Work slide for pinions—.24" to .45"
Strokes of work slide for stacked gears —.85 to 1"

GEAR MACHINES

Pitch diameter, capacity 1½"
Strokes for work slide, .40", .65", 1.00", 1.25"

OTHER PRODUCTS

THREAD MILLING MACHINES

For small sized work, external and internal. For production or miscellaneous threading. Fully motorized.

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For precision dies. Plunger diameters between 120 inches and 6 inches in 9 sizes. Shipments from stock.

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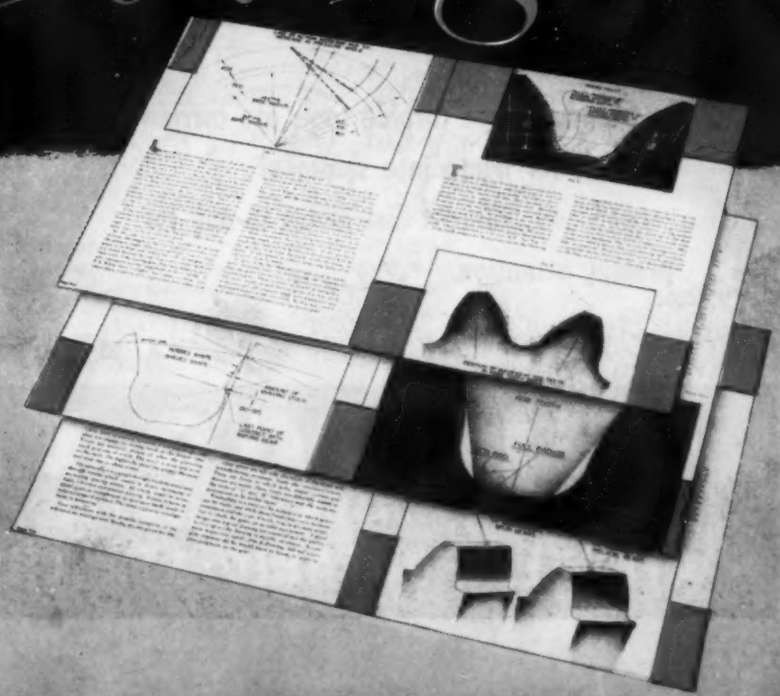
better gears



wn at right are a few pages from this new book,
sign of Gear Teeth." Detailed drawings appear
ughout the text for graphic explanation of the
ories and practices involved.

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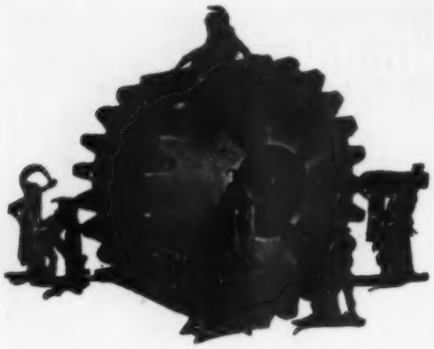

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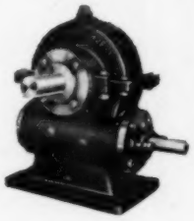

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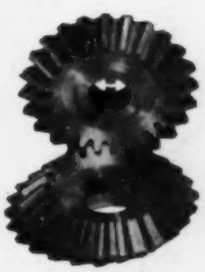

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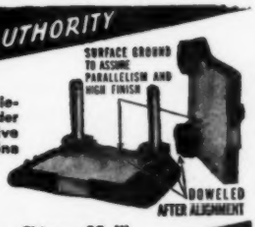

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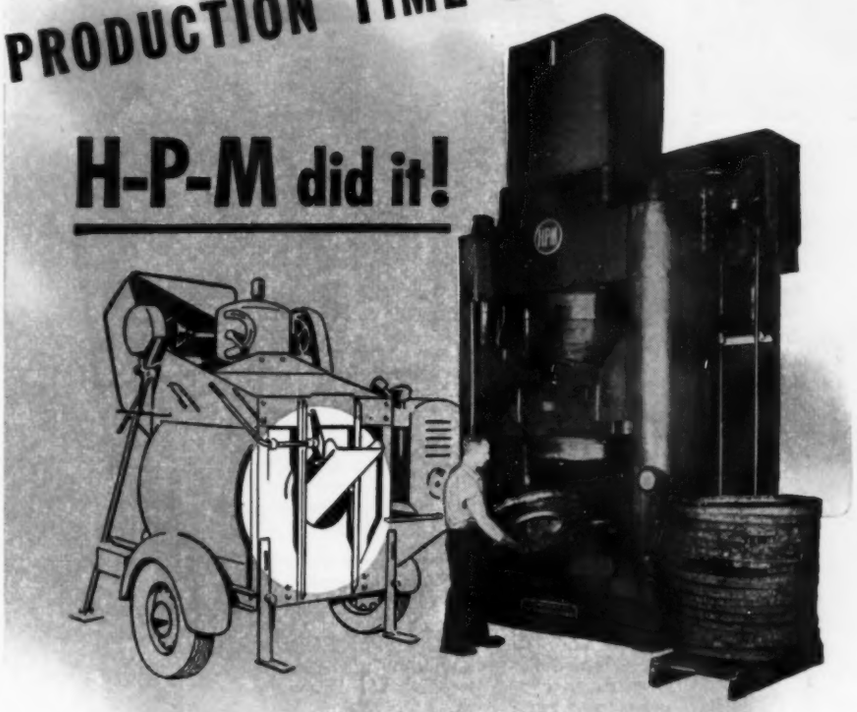

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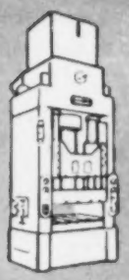

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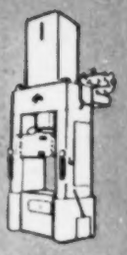
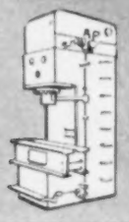


SINGLE-ACTION PLATEN PRESSES



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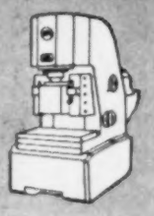

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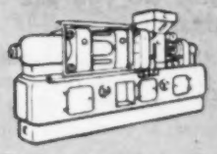

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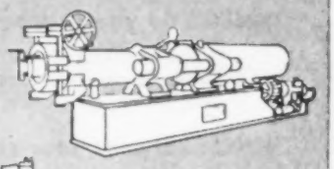

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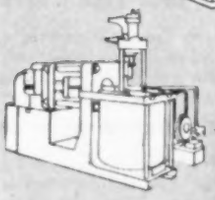

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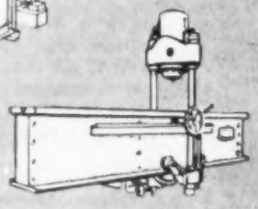

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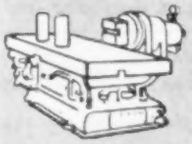

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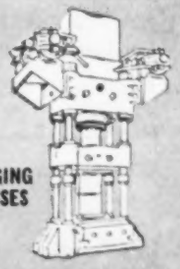

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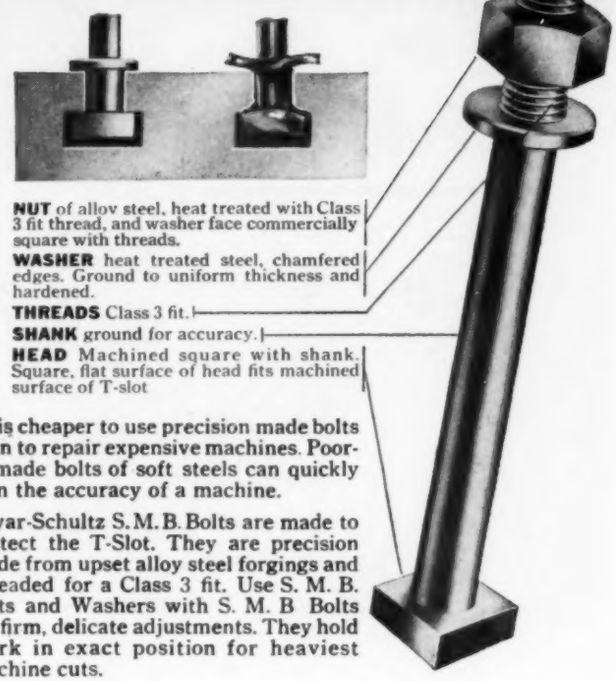
BLAKE TAP GRINDERS—FILTAIRE PORTABLE DUST COLLECTORS—
AMERICAN TOOL HOLDERS—BLACK DIAMOND PRECISION
DRILL GRINDERS—WALTHAM CUTTER SHARPENERS—

Protect this VITAL PART of Your Machines!



NUT of alloy steel, heat treated with Class 3 fit thread, and washer face commercially square with threads.

WASHER heat treated steel, chamfered edges. Ground to uniform thickness and hardened.

THREADS Class 3 fit.

SHANK ground for accuracy.

HEAD Machined square with shank. Square, flat surface of head fits machined surface of T-slot

It is cheaper to use precision made bolts than to repair expensive machines. Poorly made bolts of soft steels can quickly ruin the accuracy of a machine.

Boyar-Schultz S. M. B. Bolts are made to protect the T-Slot. They are precision made from upset alloy steel forgings and threaded for a Class 3 fit. Use S. M. B. Nuts and Washers with S. M. B Bolts for firm, delicate adjustments. They hold work in exact position for heaviest machine cuts.

BOYAR-SCHULTZ

COPPER HEAD LAPS . . .

Economy and accuracy are the outstanding features of Copper Head Laps. They work rapidly. Only the replaceable copper sleeves wear out. Sleeve adjustment permits maintaining correct lapping size till worn out when it is replaced with a new one. Save costly tool room time. Available from stock in standard sizes, $\frac{1}{8}$" to $2\frac{1}{2}$" Diameters.

BOYAR-SCHULTZ CORPORATION

2109 WALNUT STREET • CHICAGO 12, ILL.

GEARS
of Neloy (OR NELOY MOLY)
THE Preference of INDUSTRY

(NE) is the symbol of quality recognized by users of industrial gears everywhere. Our Foundries specialize in Gear Blank Castings of Alloy and Carbon Steel. The facilities of the National-Erie Corporation at your command, permit complete control from raw material to the finish machined gears. Spur, bevel and Sykes Herringbone of Neloy (or Neloy Moly) meet with outstanding success in industry because they are giving excellent service in many varied applications.

First and final costs of Neloy (or Neloy Moly) gears are reasonable. The (NE) Flame Hardening Process combines the high surface hardness of carburized or case hardened treatment, combined with the toughness of a fully quenched medium carbon alloy steel.

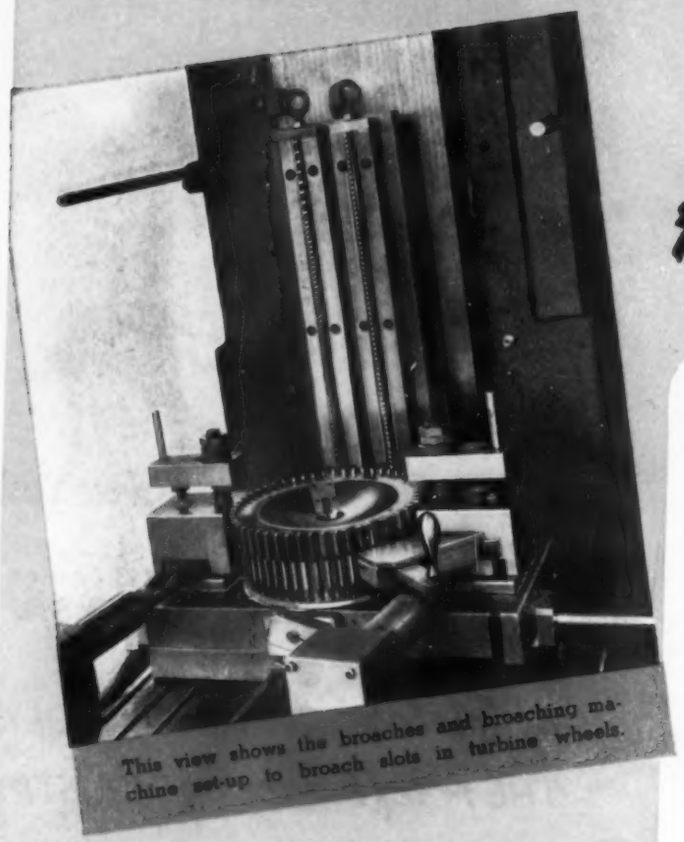
Neloy (or Neloy Moly) is the Ideal alloy steel for gears . . . the Preference of Industry. Let us help you meet your gear requirements.

Write for bulletin No. 7.

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

Broaching PUTS TEETH IN THE JOB FASTER— For Less!



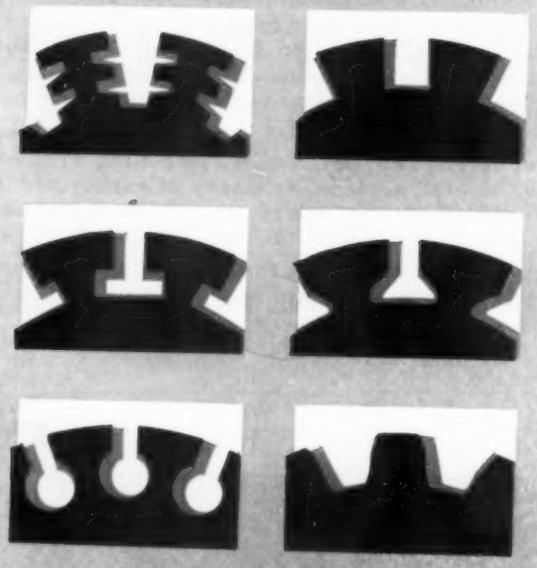
This view shows the broaches and broaching machine set-up to broach slots in turbine wheels.

DETROIT BROACH COMPANY designed and manufactured the broach tooling to produce the slots around the circumference of many different turbine wheels. The result—perfect form, better finish and many more parts per hour than could be produced by any other method.

This application has led to others where slots, or teeth, are required around the outside diameter. In every case the savings in production costs have soon paid for the tooling. Further, the "human element" is practically eliminated when the job is broached.

Call the Detroit Broach representative in your locality now for real production savings—savings that will help to beat today's rising manufacturing costs.

SOME OF THE FORMS BROACHED



DETROIT *Broach* COMPANY
20201 SHERWOOD AVENUE
DETROIT 12, MICHIGAN

SNOW FULL UNIVERSAL TAPPING MACHINE

12-24 TAP-2 HOLES
DATA FOR TAPPING OPERATION:
OPERATION: TAPPING 2 HOLES-3/16" DEEP THROUGH-12-24 TAP.
MACHINE: NO 2UT-"SNOW" UNIVERSAL TAPPING MACHINE.
FIXTURE: NO 337 DIAL FIXTURE.
MATERIAL: DIE CAST ALUMINUM
MANUFACTURING CO.
LOCK BODY

The SNOW Full Universal Tapping Machine is complete with electric controls, motor driven lubricant pump, air operated table lift, and dirt and moisture trap.

All types of air operated indexing and clamping fixtures and jigs can be instantly synchronized with the cycle of the machine. The electric controls provide various types of operation to suit any specific tapping problem. Extreme sensitivity in the application of power eliminates tap breakage, and allows class 3 and 4 fits to be obtained at no loss in production.

Years of experience and thousands of installations enable us to assist you in any of your tapping requirements. Submit blue prints and sample parts for specific recommendations, production estimates, and tooling data.

FULL UNIVERSAL TAPPING, DRILLING AND THREADING MACHINES

SNOW MANUFACTURING COMPANY

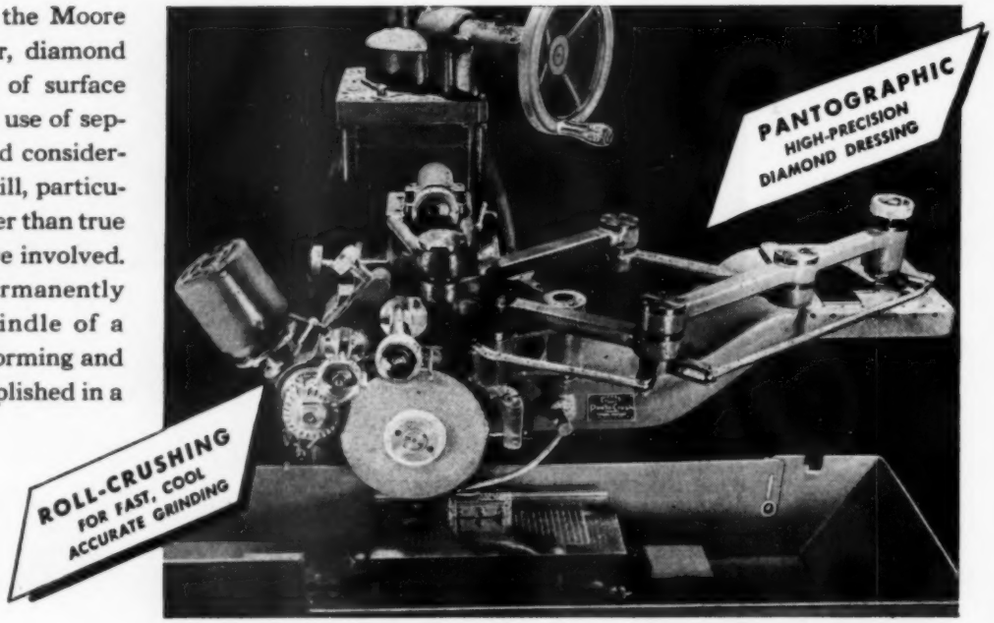
437 EASTERN AVE., BELLWOOD, ILL. • SUBURB OF CHICAGO

Now you can combine roll-crushing and diamond dressing in a single wheel dresser to speed form grinding

Before the development of the Moore Panto-Crush Wheel Dresser, diamond dressing and crush-forming of surface grinder wheels called for the use of separate devices. These required considerable set-up and operating skill, particularly where odd contours other than true radii and straight surfaces are involved.

Now with the Moore, permanently mounted on the wheel spindle of a surface grinder, both crush-forming and diamond-dressing are accomplished in a single mechanism.

Here's how this 2-in-1 machine does it:



1. Combines Pantograph, working directly from template, and *Roll-Crushing* in one device, accurately related to spindle.

2. Switches from one method to the other without disturbing workpiece setting or location of either trueing device.

3. No setting up of complex attachments each time wheel is dressed . . . no raising of wheel spindle from work to dress, yet wheel spindle may be raised or lowered without losing relation of wheel form to dressing device . . . crusher method saves diamond costs.

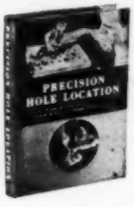
4. Assures highest roll-crushing accuracy and economy. Crusher roll is *ground* and *used* on same spindle, without disturbing position . . . no expensive machine required to grind crusher roll . . . no worry about hardening distortion, because roll is ground *in place* from the solid directly from template.

5. Takes Skill out of job, yet adds advantage of crush dressing for heavy cuts without heating work, and ultra-precision diamond dressing.

6. Device need not be removed to use machine as conventional surface grinder.

Both MACHINE DESIGN and MACHINERY magazines devoted considerable editorial space to technical discussions of the value of this ingenious new mechanism. We'll be glad to send you reprints and a descriptive catalogue on Panto-Crush.

MOORE SPECIAL TOOL CO., Inc.
738 UNION AVENUE, BRIDGEPORT 7, CONN.



HAVE YOU BOUGHT YOUR COPY OF "PRECISION HOLE LOCATION"?

Over 5,000 copies of this valuable book on toolmaking practices have been sold to date. Available at special price of $3 in U. S. A.; $3.50 outside U. S. A. 448 pages, over 400 illustrations. 184 pages of Woodworth Coordinate Location Tables from 3 to 100 holes. Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.

Add a MOORE to YOUR TOOLROOM

JIG BORERS · JIG GRINDERS · PANTO-CRUSH WHEEL DRESSERS
DIE FLIPPERS · COMPLETE LINE OF HOLE LOCATION ACCESSORIES

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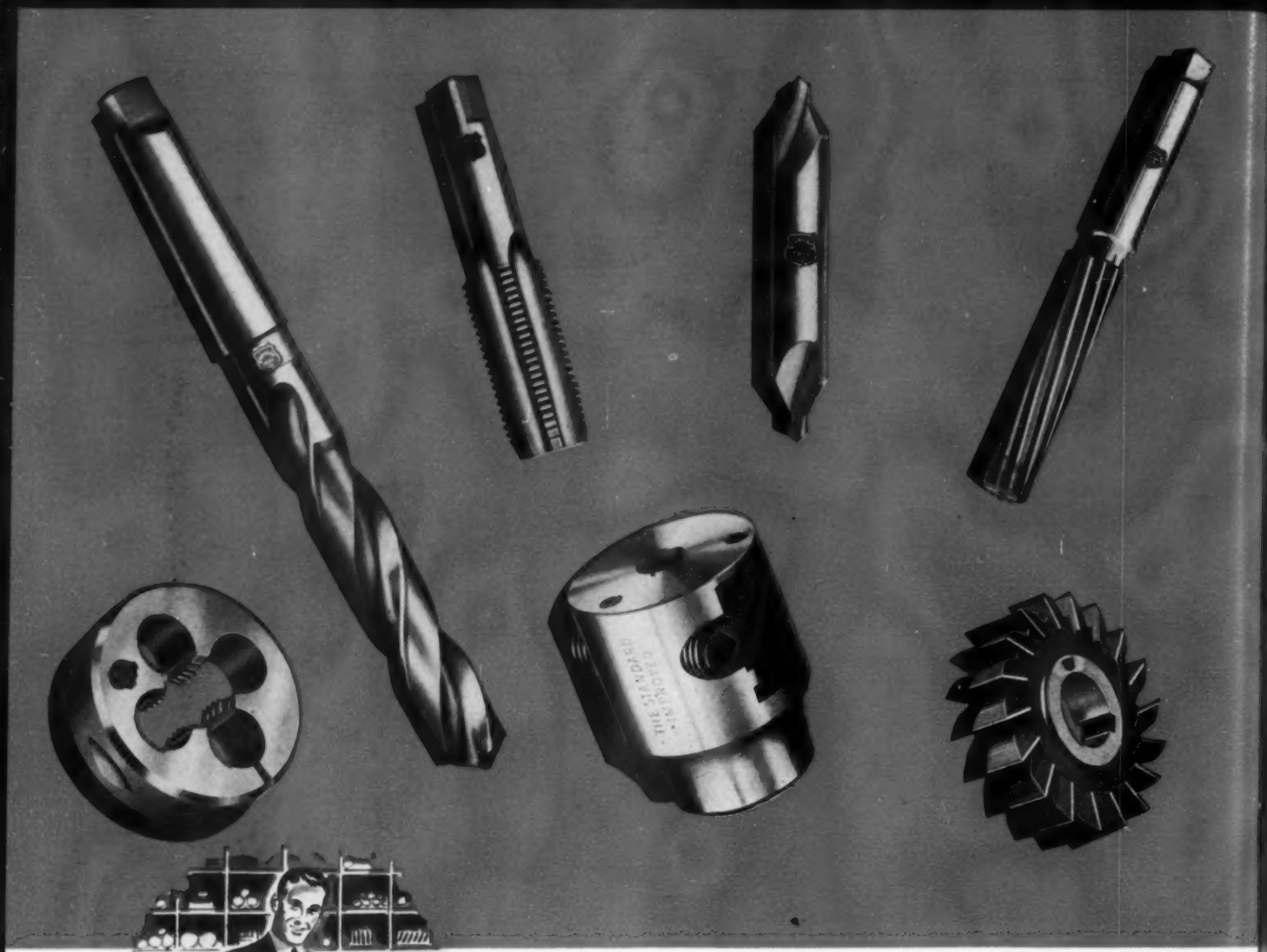
The "BUY" word for Production

• The quality, accuracy and uniformity of Shield Brand Tools is confirmed by the fact that for 66 years they have been used continuously in America's leading mass production industries. Today they are specified and used wherever tough jobs demand top performance to secure low-cost production. Thus, Shield Brand is the *Buy* word most often used for drills, reamers, taps, dies, milling cutters and special tools. Leading Mill Supply Distributors from coast to coast will gladly supply your requirements.

THE STANDARD TOOL CO.

CLEVELAND, OHIO

Warehouses: New York • Detroit • Chicago



Simplify requisitions, records, stock keeping and inventory problems

STANDARDIZE on Shield Brand Drills, Reamers, Taps, Dies, Milling Cutters and Special Tools.

Shop requisitions will be simplified by the elimination of multiple names, and possibilities of annoying, time-taking errors reduced. Purchasing procedure will be streamlined and purchase records simplified and reduced in number. Stock keeping will require less time and space—often inventories of cutting tools can be reduced.

Shield Brand Tools are supplied coast to coast by leading Mill Supply Distributors.

In efficient, uniform low-cost performance these tools are admitted tops. We welcome your inquiries about cutting tool problems.

STANDARD TOOL CO.

THE STANDARD TOOL CO.

CLEVELAND

Warehouses: New York · Detroit · Chicago

SUNNEN HONING Saves Production Time... Produces Straight Round Holes, At Low Cost ...Duplicates Sizes Quickly and Easily

With the Sunnen Precision Honing Machine you can size and finish internal diameters from .120" to 2.625" quickly and accurately. This machine hones a straight round hole, free from bell-mouth, taper, and rainbow effects. Produces a full bearing surface that increases the service life of parts. There are no high spots, no ridges, no chatter marks to wear away and cause loose fits.

Accuracy is guaranteed to be within .0001", and a complete line of abrasives is available to produce any degree of surface finish desired. Accurate holes can be honed in steel, cast iron, bronze, aluminum, carbides, ceramics, plastics or glass.

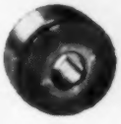
Sunnen Honing often replaces the preceding grinding and reaming operations — resulting in greater accuracy and much smoother finish at lower total cost per piece.

You can also round up holes with minimum stock removal, correct heat-treat distortion, remove burrs and flash from drilled, machined, punched or molded parts.

Sunnen Honing provides real savings in long run production costs — and even greater savings on job lots and short runs when frequent size changes are necessary.

Find out how you can save time and money — and increase production of accurate internal diameters. Write for complete information — or call in a Sunnen engineer.

Typical Examples



Drawing and Blanking Die. "Saves time in producing smooth base metal finish."

Smooth surfaces provide long life for washing machine parts.

Two lands, 7/8" long, honed in perfect alignment.

Bell-mouth eliminated, production increased on these line reamer bushings.

Bronze Valve. The Sunnen method of honing is used to secure a high finish and accuracy.

SUNNEN

TRADE MARK REG. U. S. PAT. OFF. • MARCA REGISTRADA

290

SUNNEN PRODUCTS COMPANY

7941 Manchester Avenue • St. Louis 17, Missouri

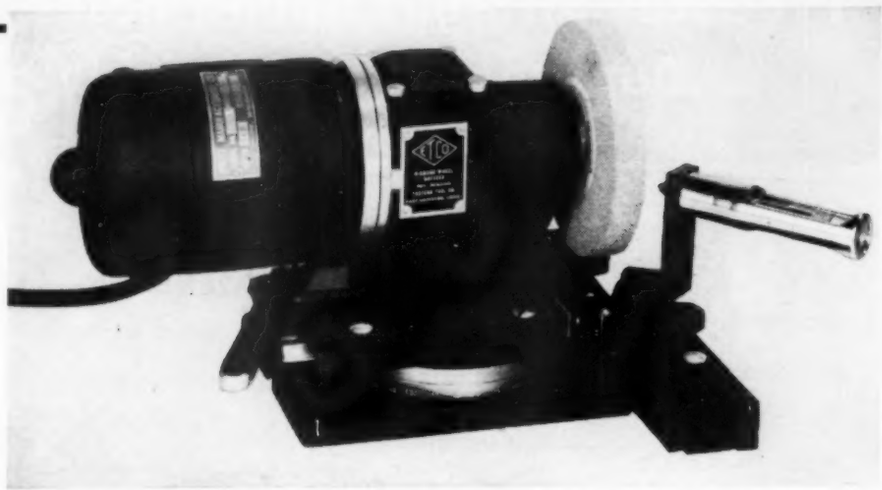
Canadian Factory: Chatham, Ontario

Attention- DIAMOND WHEEL USERS!

ANNOUNCING
the NEW

ETCO

MACHINE
FOR DRESSING
DIAMOND WHEELS



Peripheries, angles and radii can be dressed without removing diamond wheels from their spindle, thereby saving valuable time and assuring extreme accuracy.
Outstanding features include vernier, micrometer and precision bearings.

If you are interested in getting the maximum results from your diamond wheels, it will be to your advantage to explore the possibilities of the NEW ETCO Diamond Wheel Dresser.

Send at once for further details.

AGENTS: Desirable territories now open.

EASTERN TOOL COMPANY
"MACHINE DIVISION"
East Hartford 8, Connecticut
Also Manufacturers of Carbide Boring, Forming and Multipoint Tools.

---

for Sawing METAL *as* HARD *as a* FILE
or Trimming FORMED PARTS
- FAST!

Actual photo of file friction sawn on Tannewitz High Speed Band Saw

Tannewitz
HIGH SPEED BAND SAWS

Cost reductions that are downright amazing are effected in the cutting of an extremely wide variety of materials by friction sawing with TANNEWITZ HIGH SPEED BAND SAWS: flat sheets, hardened or soft steels, armor plate plastics, and many others. Formed aluminum parts can be trimmed without using a rest of any kind. Whatever your cutting problem, chances are it can be done faster and better with TANNEWITZ HIGH SPEED BAND SAWS. Write for booklet. "FRICTION SAWING."

THE TANNEWITZ WORKS
GRAND RAPIDS 4, MICHIGAN

ECONOMY

THE W&B Co

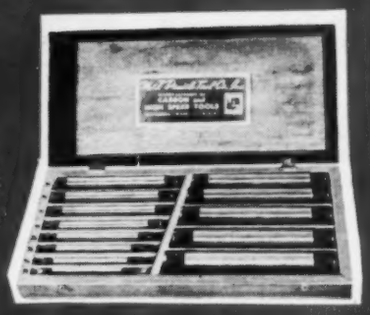
Economy Lubricant 1888
for grinding and cutting

Backed by sixty years' leadership in quality lubricants 1888-1948

THE WHITE & BAGLEY COMPANY
WORCESTER, MASS. • DETROIT, MICH.
Originators of Grinding Lubricants

DANIELS *Precision* REAMERS

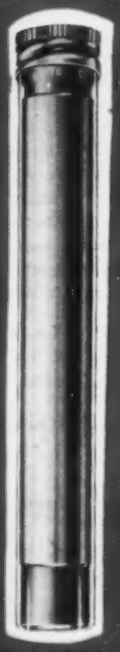
Accurate to .0002 inches



Set No. 31—¼ to ½ inch by 16ths. Carbon Steel.

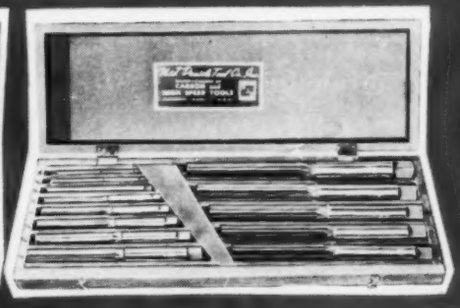
LATHE MANDRELS

Set No. 32—¼ to 1 inch by 16ths.



CENTER REAMERS individually packed in transparent plastic tubes for protection of cutting edges and for selecting proper size without unwrapping or handling.

DANIELS LATHE MANDRELS. Individually packaged in transparent plastic tubes. Fine surfaces fully protected. Proper size selected without exposure to dirt or damp fingers.

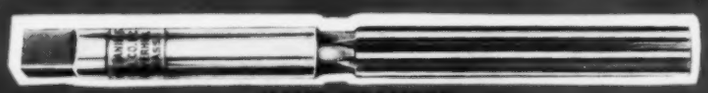


¼ to ½ inch by 16ths.
Set No. 5 Carbon Steel
Set No. 5H High Speed Steel

HAND REAMERS

¼ to 1 inch by 16ths.
Set No. 6 Carbon Steel
Set No. 6H—High Speed Steel

Daniels Countersink and Spotfacer. Tapered Reamer for enlarging holes. Taper is from one-eighth to one-half inches. Available with T-handle or for use in a bit brace. An extra shank is available to fit a one-quarter inch chuck. For use in power tools.

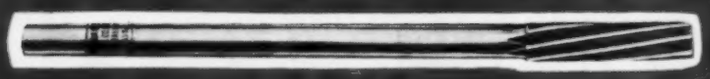


HAND REAMERS

With Straight Flutes. (Also Furnished With Spiral Flutes)

CHUCKING REAMERS

With Straight Flutes and Taper Shanks. (Also Furnished With Spiral Flutes)



CHUCKING REAMERS

With Straight Flutes and Straight Shanks. (Also Furnished With Spiral Flutes)

"Accurate to .0002" " is both an achievement and a symbol of Daniels Tools. Years of experience enables Daniels to maintain highest standards of workmanship and quality. Every tool bearing The Daniels name is your guarantee of precision.

Daniels Reamers and Lathe Mandrels are available in all standard sizes. Hand Reamers and Center Reamers are available in either carbon or high-speed steel, all other types are available in high-speed steel only.

If your local mill supply house does not carry the Daniels line, get in touch with us direct.

Daniels has an outstanding record for prompt delivery of special reamers in ten to fifteen days from receipt of order.

N. J. DANIELS TOOL CO., INC.

Manufacturers of

CARBON and HIGH SPEED TOOLS

67-71 WASHINGTON STREET • HAVERHILL • MASSACHUSETTS

Tool life greatly increased by reconditioning cutting oil *with* BARRETT OIL EXTRACTION SYSTEMS

Reports from plants using Barrett Oil Recovery and Reconditioning Systems show surprisingly high percentages in increased tool life. Then, too, users are enthusiastic as to the improved condition of the reclaimed oil as well as the high returns on the investment. Some set-ups in plants engaged on defense production have paid for themselves in a few months.

The Barrett Centrifugal Oil Extractor—which is part of a complete system—recovers 100% of the removable oil or 98½% of the contained oil from chips and turnings in 2 minutes or less. Complete Barrett oil recovery and reconditioning systems include Extraction, Sterilization and Sedimentation, together with filtration. The units involved are available in various sizes, individually or as a group, and are available with full manual control, semi-automatic control or with full automatic control requiring only loading, unloading, starting and stopping of the extractor by the operator. Complete plans including storage tanks for reclaimed oil or for use in conjunction with existing equipment are also available.

With the Barrett system, abrasive-free oil assuring longer tool life can always be depended on. With Barrett Sterilization and Sedimentation equipment, cutting oil is also safe and free from contamination.

Investigate Today by Sending for Descriptive Bulletin of Oil Recovery and Reconditioning Systems

Barrett Centrifugal Oil Extractor—the heart of Barrett Cutting Oil Recovery and Reconditioning Systems.

THE LEON J. BARRETT COMPANY, 1800 Grafton Road, **WORCESTER, MASS.**

Designers and Builders of Centrifugal Machinery

SHELDON

Makes ALL THREE

These 3 precision machine tools are a necessary part of every completely tooled shop . . . a modern precision lathe with "Zero Precision" tapered roller bearings that will retain its extreme accuracy at new high operating speeds . . . a convenient back-geared shaper that embodies all major design improvements . . . a capable small milling machine that will do accurate work . . . all three are extremely moderate in price.

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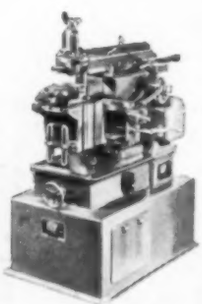
No. 3000A Size "O" Milling Machine

No. TRBS-56 11" Lathe 1" Collet capacity



No. 8000 12" Shaper

SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers

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Patented Cutting Off Tool Holders
Patented Cutting Off Blades

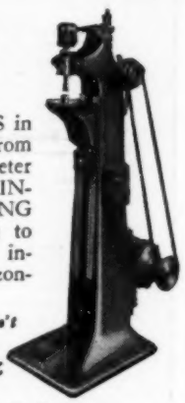
ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips—MEANS MAXIMUM CUTTING EFFICIENCY

Manufactured By
J. Milton Luers — 12 Pine St. — Mt. Clemens, Mich.
Produced under License Issued by John Milton Luers Patents Inc.

GRANT

RIVETERS — PIONEERS in their line—head rivets from smallest to ⅝" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.



THE GRANT MFG. & MACHINE CO.
85 Silliman Ave., Bridgeport, Conn., U. S. A.

60 YEARS MANUFACTURING

Multiple Spindle Drilling and Tapping Machines — Automatic Drilling and Tapping Units — Multiple Spindle Attachable Drill Heads—Hot and Cold Swaging Machines—Hammering Machines — Tools, Jigs & Fixtures — Contract Work — Special Machinery

LANGELIER MANUFACTURING COMPANY,
PROVIDENCE 7, RHODE ISLAND

ROTO-CLONE

removes the double danger of fibrous, greasy dust

View showing three of 14 Type N Roto-Clones collecting buffing dust in this modern plant.

DUST presented a double danger in the polishing department of Mouldings, Inc., Indianapolis, Ind., producers of stainless steel moulding for the automotive field. Buffing metal moulding strip produces a fibrous, greasy dust which is both a fire and health hazard. Here, as in scores of plants, Type N Roto-Clones solve the problem by wet collection of the material.

The Type N Roto-Clone* Hydro-Static Precipitator combines centrifugal forces and intimate intermixing of water and dust-laden air for extremely high cleaning efficiency. It is compact in design, has no moving parts to foul, requires little maintenance and the once dangerous dust is easily removed in harmless sludge form.

The Type N Roto-Clone is available for servicing individual stands, as illustrated, or for use with central system exhausting a group of dust sources. For complete information write for copy of Bulletin No. 277 or contact your local AAF representative.

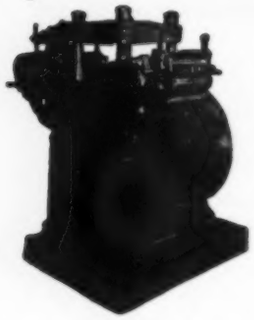
AMERICAN AIR FILTER CO., INC.
207 Central Avenue, Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

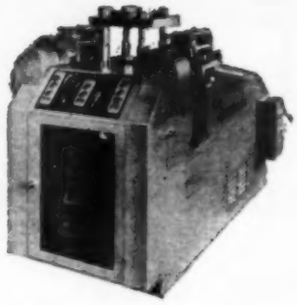
**Roto-Clone is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.*

AAF®

®ROTO-CLONE
DUST CONTROL EQUIPMENT

Which Dieing Machine fits YOUR production?





STANDARD Dieing Machine

Standard Dieing Machines are made in sizes from 10-tons to 300-tons capacity.

Their unique "up-side-down" design incorporates the following features:

"Indirect Underdrive" whereby the flywheel is located in the base of the machine, with resultant low center of gravity and minimizing of vibration.

Flywheel actuates a counter-balanced lower crosshead which delivers thrust-free motion to the punch-carrying upper crosshead as described below.

Upper crosshead which holds male die is pulled downward by four alloy steel rods which are "Precision-guided" in long adjustable taper bushings, assuring utmost precision of alignment. Precision of operation makes possible precision of product consistently held within .0002" limits when required.

Produces 1 to 20 stampings complete per stroke at speeds up to 600 S.P.M., including blanking, piercing, drawing, forming, coining, extruding and broaching in the same piece as necessary.

Speedmaster Dieing Machine

The Speedmaster adds to basic Dieing Machine advantages a host of new features permitting complete-per-stroke production at NEW HIGH SPEEDS WITH HIGH DIE LIFE.

- Patented Counterbalance System added to lower crosshead so completely eliminates vibration that machine WILL OPERATE OVER ITS ENTIRE SPEED RANGE WITHOUT BEING BOLTED TO THE FLOOR.
- Centralized Variable Speed Control giving the operator finger-tip control to adjust to the optimum which the work will permit.
- Aluminum alloys reducing inertia of reciprocating parts.
- Centralized Controls, operating 100% from one position.
- Automatic Lubrication to required points.
- Friction Clutch Pneumatically actuated, electrically controlled.
- SPECIAL DIES NOT REQUIRED. The great majority of dies being used in conventional presses, can be used in the Speedmaster with little or no modification.
- Re Carbide Dies — the Speedmaster gives the speed range suitable for carbide dies, and at the same time the "Precision-guiding" essential to assure safe operation and maximum life.

Complete-per-stroke Stamping Production

H & W Engineers assist you

Our engineers assist you in deciding which types and capacities of machines are best suited to your production. They help you adapt existing dies to Dieing Machine use. They help you transfer the production of existing stampings to Dieing Machines. They work with you in designing new stampings for Dieing Machine production, including the type of dies.

REQUEST ILLUSTRATED CATALOG 47

THE HENRY & WRIGHT MFG. CO.

487 WINDSOR STREET HARTFORD 1, CONN.

HENRY & WRIGHT DIEING MACHINES

"COLUMBUS DIE-TOOL"

Specialists for Your Tooling Problems

Columbus Die-Tool specialize in designing and manufacturing special-purpose machinery and tools for particular jobs. Our wide reputation for mechanical skill is based on more than 40 years of sound experience. Send us your tooling problem for quick, accurate, economical solution.

JIGS • FIXTURES • SPECIAL TOOLS
BUILDING COMPLETE MACHINE TOOLS
UNITS FOR MACHINE TOOLS
PUNCHES AND DIES

COLUMBUS DIE-TOOL and Machine Co.

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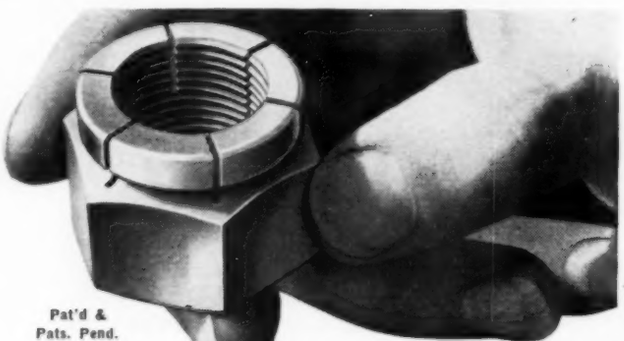

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The one-piece, all-metal "Flexloc" packs maximum usefulness in minimum space by combining, as it does, a stop, a lock and a plain nut all in one.
Every thread—including the locking threads—takes its share of the load. "Flexloc" accommodates itself to a wide range of thread tolerances . . . can be used over and over again without losing much of its locking torque . . . is not affected by temperatures likely to be met within the field of Mechanical Engineering . . . and being a "stop" nut, it stays locked in any position on the threaded member. The "Flexloc" is processed to have an exceptionally uniform torque.
The *Thin* "Flexloc" has become very popular because its *tensile* is so high and the space it occupies so small.
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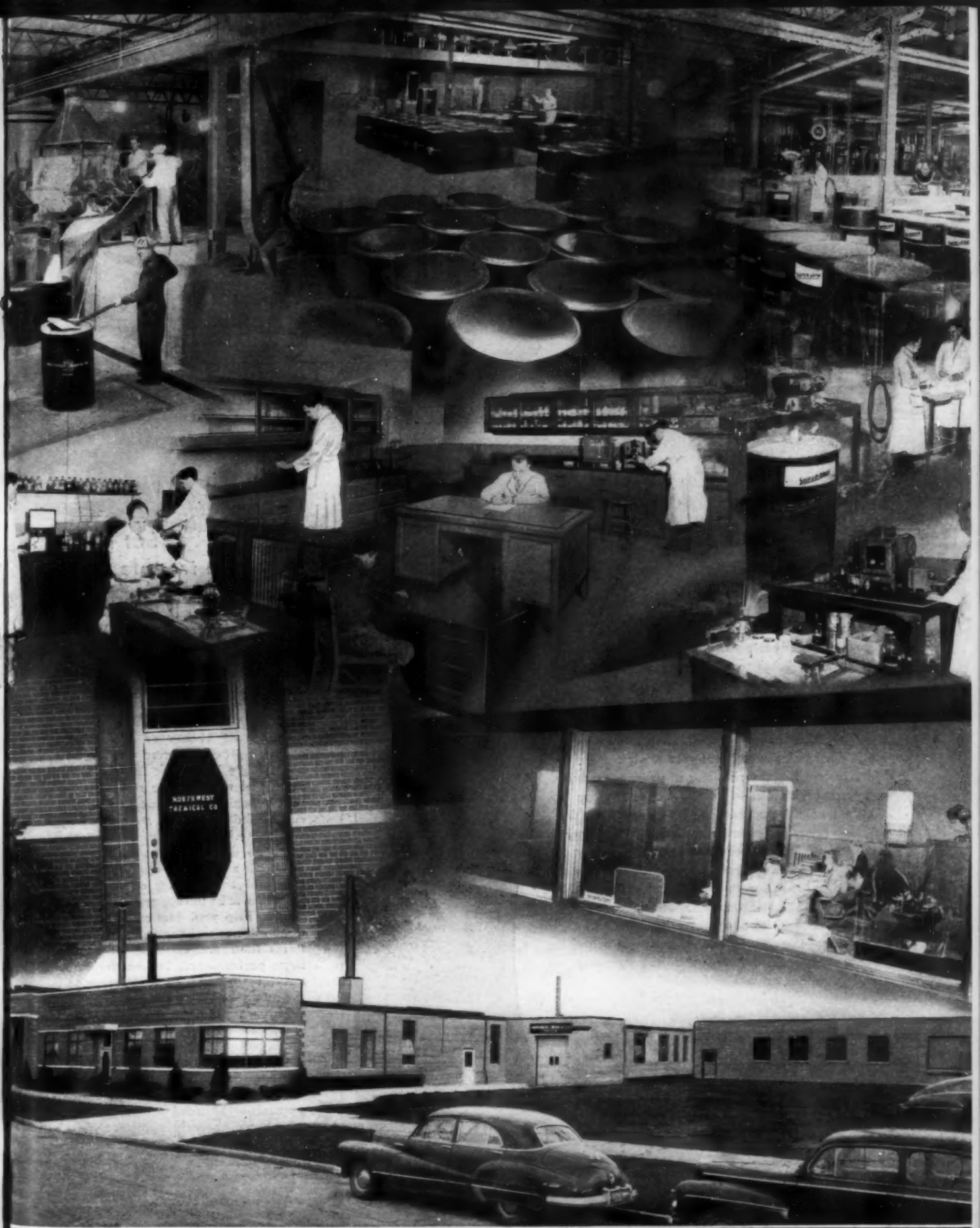

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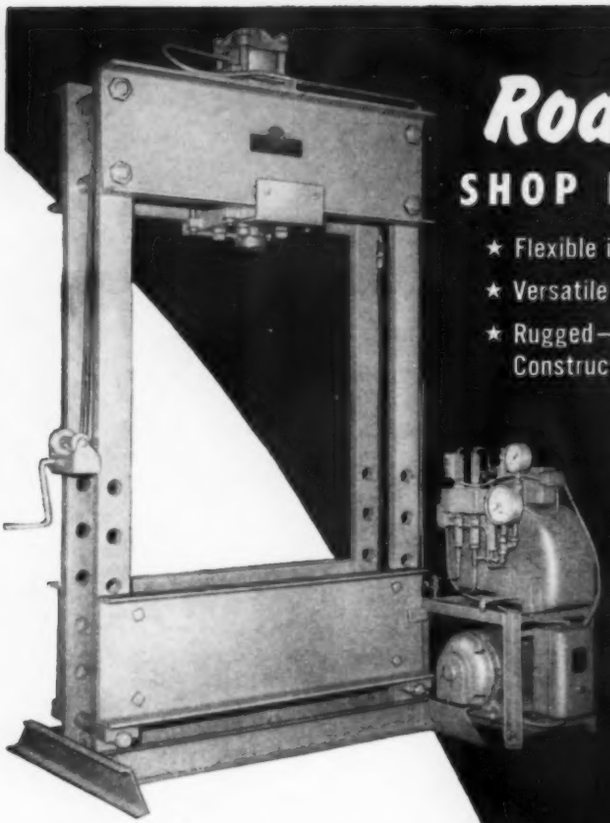

Illustrated (left) is the Rodgers 150 ton Stationary Shop Press with extra height, equipped with 2-way Travel Cylinder and "D" Pump with 4-way Valve Arrangement.

The Rodgers "Sixty"—60 ton Shop Press (shown above) takes care of those miscellaneous jobs that waste so much time and labor. Available with hand operated pumps, or with gear head motor drive, also powered with "D" pump power unit.

Rodgers 100-ton Stationary Shop Press powered with 4-Speed Hand Operated Hydraulic Pump, also available with "D" pump power unit. Please note that on all presses the cylinder is movable across the entire width of press.

For tough service and maintenance work in pressing, squeezing and forcing, there is a Rodgers Press to meet your requirements. These rugged, flexible shop presses are available in 60, 100, 150 and 200 ton sizes. (300 and 400 ton capacity presses are available upon special order). They all embody the same proved Rodgers design and performance features: Bolster of press is raised and lowered by a hand crank . . . special alloy steel pins can be adjusted to allow desired opening . . . cylinders may be had with one way travel or two way travel in ram travel lengths from 6" to 14" as desired—frame construction is of strong, durable rolled steel plate. Power is supplied by self-lubricating hand pumps or power driven pumps.

Save time and labor on your jobs with a Rodgers Shop Press—the exact model that is best suited for your needs. You'll get prompt delivery on any standard model press.

✻ *Send for this catalog giving complete descriptions, illustrations and specifications of Rodgers Shop Presses. There's no obligation. Write today for your copy.*

Shop Presses

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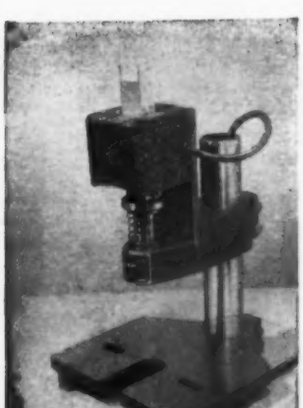

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6000 strokes per hour

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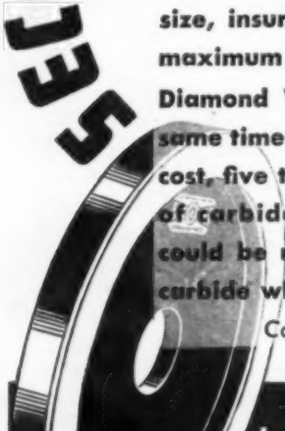

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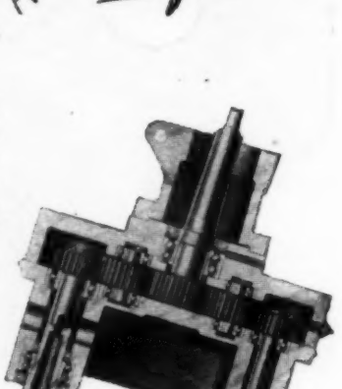

For complete engineering information, write to: Engineering Department, Thriftmaster Products Corporation, 1048 N. Plum St., Lancaster, Pa.

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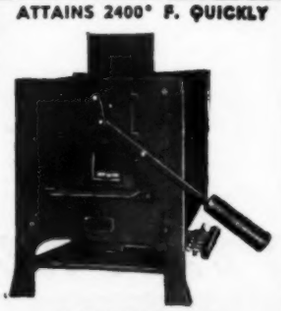

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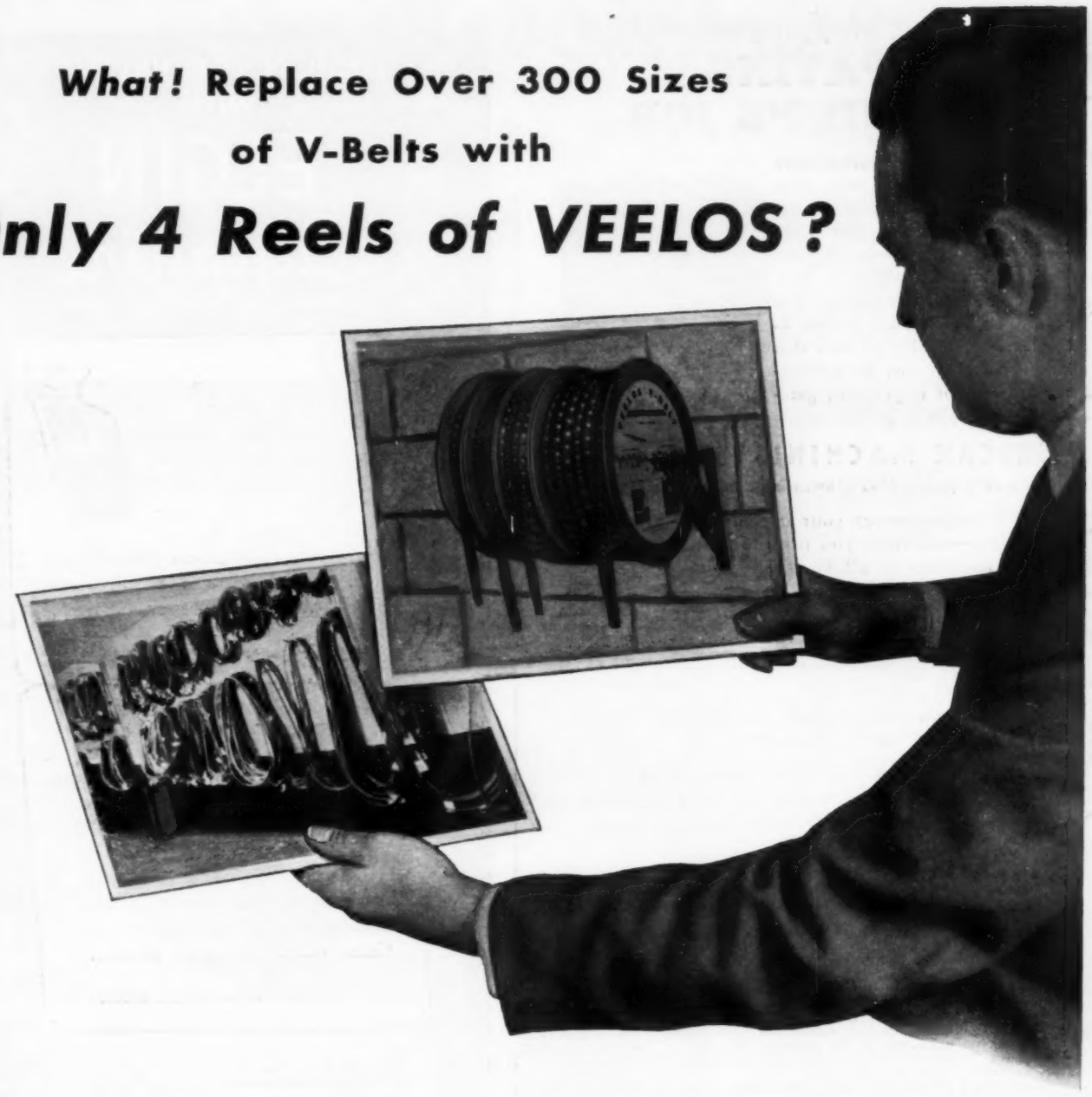

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Madison *Boreaming* performed through the use of these two Madison tools will deliver finished holes which usually are achieved only through the use of three to five ordinary tools.

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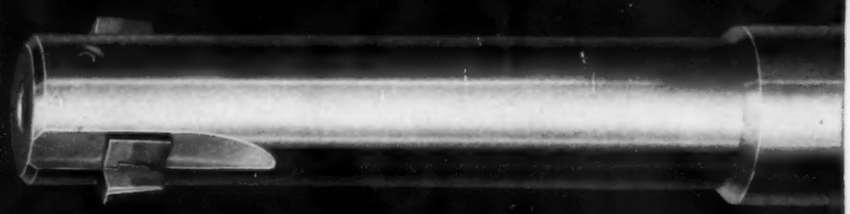

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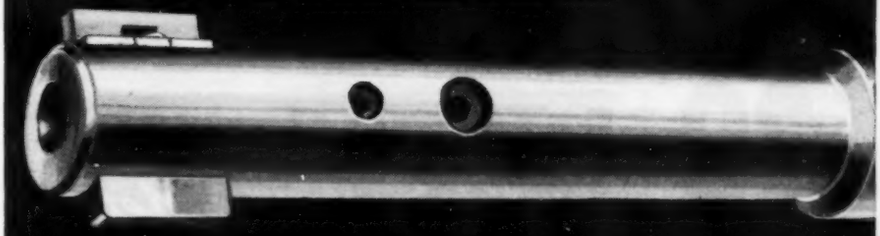
In many cases, the Madison Rough Boring Tool will remove as much stock in one pass as an ordinary single point tool removes in three passes . . . and at faster speeds. Madison design assures rough bored holes that are straight and true, and ideally prepared for a better finishing job by the Madison Finish Boring Tool.



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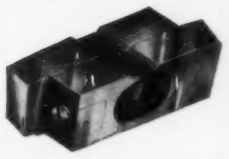
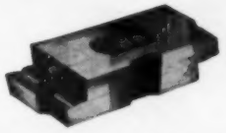


Rough Boring Cutter



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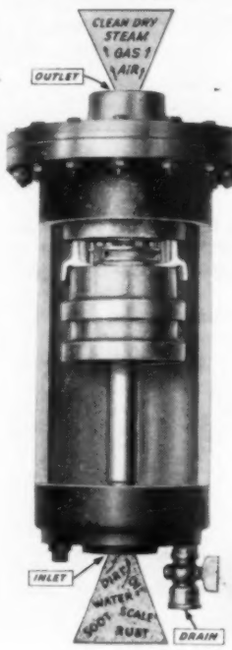

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4th spindle—Tapping (reversing motor)

plus STANDARD MOTOR — EACH SPINDLE

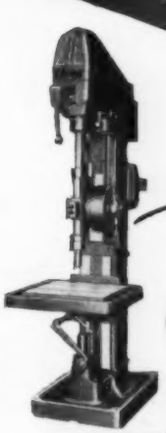
Each spindle of AVEY BMA-6 individually motor-driven by standard frame constant speed motor. Foot-mounted motor easily interchanged or replaced. Standard motors can be stocked.

plus SIX SPEED CHANGES

On the AVEY BMA-6 six speed changes are made through selective, sliding gears. This automotive type of gear shift is controlled by a single lever at front of machine. Provides versatility and effective operation.

plus SPEEDS OBTAINED — SLIDING GEARS

Selective, sliding gears of AVEY BMA-6 change speeds quickly and easily. Each gear is manufactured and finished by accurate, modern process, shaved, hardened and lapped. Insures smooth operation and long performance.



CAPACITY Cast-Iron

No. 2BMA6—7/8" No. 3BMA6—1 1/4"

Single to six spindle machines, equipped with hand feed, power feed or reversing motor tapping.

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CINCINNATI, OHIO

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With BOYAR-SCHULTZ No. 6-12 BENCH MODEL SURFACE GRINDER

(1) *Saving in Time.* This saving alone will justify one or more No. 6-12 Bench Model Grinders installed on tool makers' benches or in convenient places in the tool room, instantly available for close tolerance grinding of the many important small jobs encountered in every shop.

(2) *Saving in operation.* Large grinders cost more to operate, as much for the small job as for many larger jobs. Set-up time in larger machines is also a factor.

(3) *Saving in Cost.* Boyer-Schultz No. 6-12 Surface Grinder, while its capacity is nearly equal to many large machines, is priced so low that it is real economy to place one, two or three of them at strategic points in your tool room to save sending small work to large machines.

Designed to take over the tool room's smaller jobs requiring high precision grinding. Built of the finest materials and workmanship, it is sturdy, long lasting and will maintain its accuracy on all important work called upon to perform.

MODEL 6-18 PRECISION SURFACE GRINDER

Many superior features make this Boyar-Schultz Surface Grinder an outstanding performer in producing the fine finish and extreme accuracy necessary in fine gage, grinding, tool and die work as well as in some production grinding.

Its sturdy ruggedness maintains that fine accuracy for a long period of time . . . much longer than similar machines are expected to last.

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7" HORIZONTAL SHAPER
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For ANY Size Machine

Chandler-Duplex
COMBINED Boring and Facing Toolhead

NOW! REDUCED IN PRICE

A Boring Head That Won't Face Is NOT Complete!

Accuracy -- Stamina

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A Few Openings For GOOD Distributors

CHANDLER TOOL CO.
MUNCIE, INDIANA, U. S. A.

ANNOUNCING THE NEW Atlas "QUICK-CHANGE" 10" LATHE

PROVIDES INSTANT SELECTION OF 54 THREADS OR FEEDS

(QUICK-CHANGE UNIT ADAPTABLE TO ANY ATLAS 10" LATHE)

QUICK AS A FLASH, you can change threads or feeds on the new Atlas Quick-Change 10" lathe . . . 45 by simply shifting two levers on the gear box . . . 9 more by merely changing a sliding gear's position! It gives you all design and construction "extras" that have long made Atlas the leader in lathe values — plus new speed, accuracy, and efficiency in every turning operation requiring power feed.

It's easy to save set-up and operating time with Quick-Change: lever and gear positions are clearly indicated on front of gear box; gears are readily reversed or disengaged from lead screw by a convenient tumbler-gear lever. The Quick-Change does not limit the odd thread and feed capacity of the Atlas lathe. Hundreds of additional feeds and speeds . . . for metric threading, special tooling, coil and wire winding, etc. . . . are made by varying the gear train with standard Atlas change gears. An easy-to-understand "Hand Book" is furnished, showing the many setups possible on this new lathe — or on any standard Atlas 10" lathe with the Quick-Change unit added.

Other features of Atlas 10" lathes include: Timken tapered roller bearings; precision ground bed; back gears; complete V-belt drive; 16 spindle speeds; reversible automatic power cross and longitudinal feeds.

Send for new Atlas Quick-Change bulletin. Gives complete specifications and operating details on this time and money saving innovation. Your Atlas distributor can explain how the Quick-Change unit can be installed in an hour's time on your present Atlas 10" lathes.

Model QC 42, illustrated, 24" between centers . . . $250.00
Also QC 54—36" between centers $280.00
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Let our engineer study your keyseating problems.

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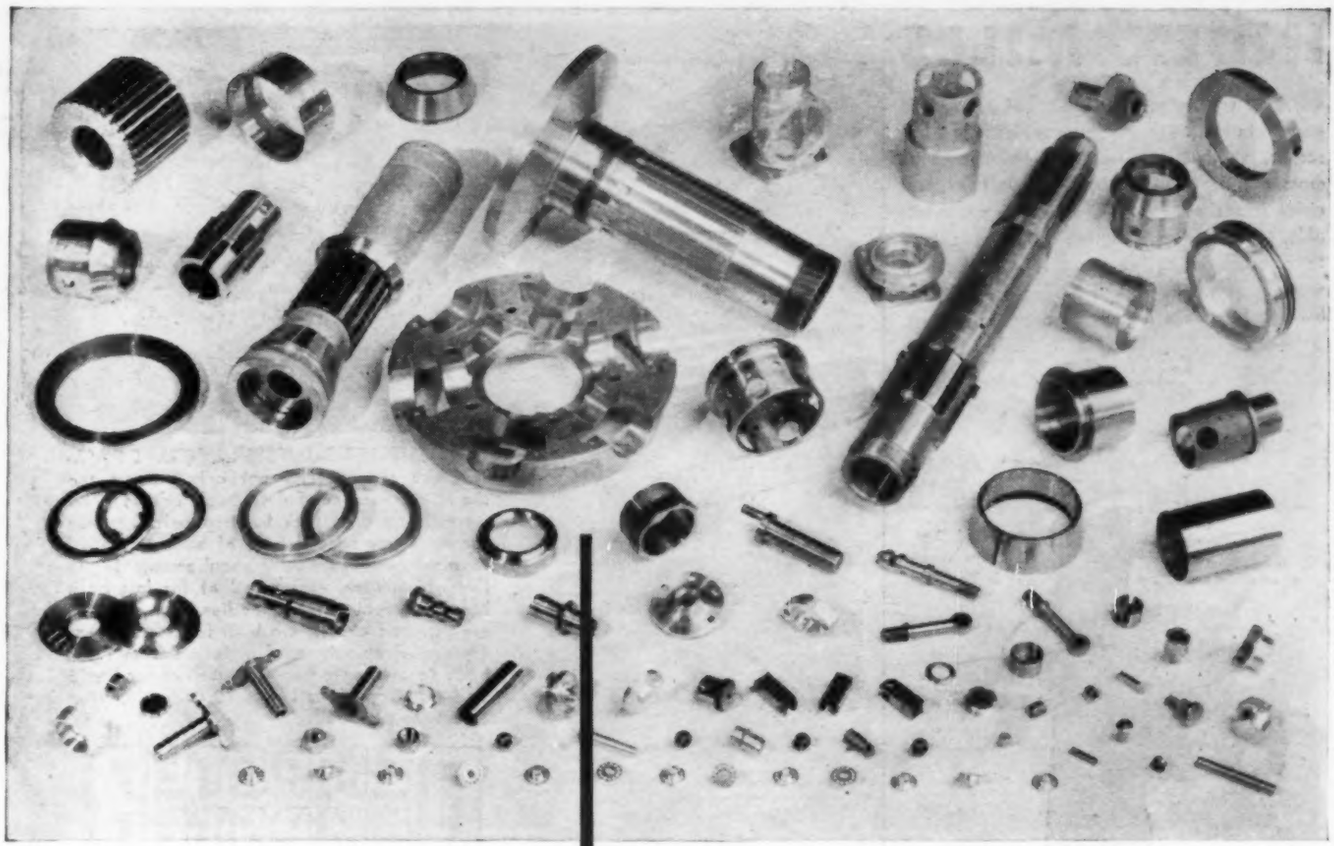

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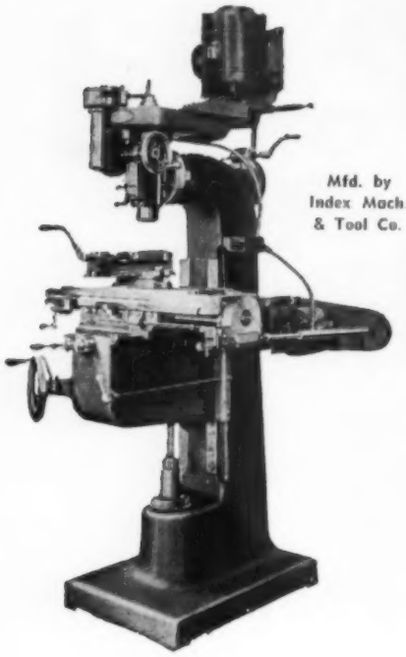

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12" Tool Room Rotary Table

A quality tool for precision work in the tool room or production line, incorporating such features as ball bearings—hardened and ground worm—quick acting throw-out for free hand turning—single movement table lock that does not cramp table out of alignment—compound trough. 12" size only.

For use on Index Mills or any other machine that will accommodate a 12" table.

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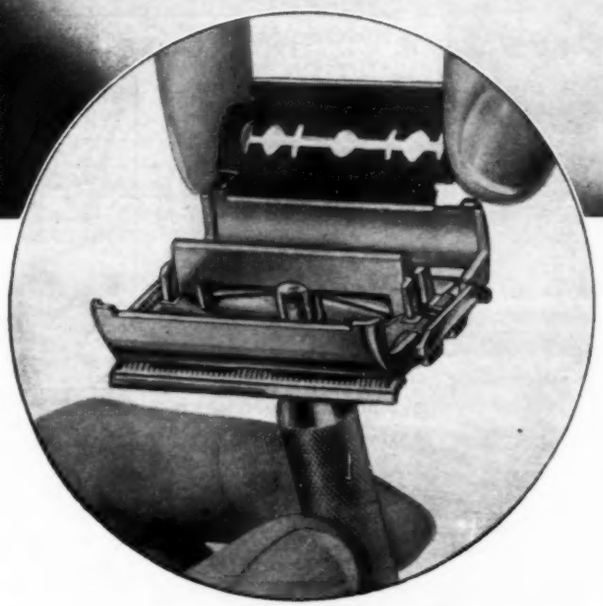

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You wouldn't throw away your good SAFETY RAZOR — because of a dull blade. Then why use old-type solid, breakable and costly feed fingers on automatics when.... HARDINGE style "B" MASTER FEED FINGERS with replaceable pads will save 30% to 80%.

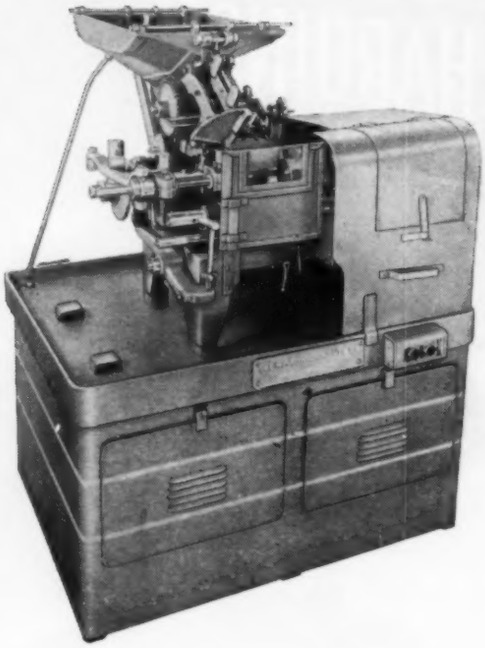
For Brown & Sharpe, Cleveland, Cone, Davenport, Greenlee, Gridley, Acme-Gridley, National Acme, New Britain, and New Britain-Gridley Automatic Screw Machines.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

The New TOWNSEND High Speed Shaver

for the AUTOMATIC handling of "SECOND OPERATIONS"



This new machine has been designed for doing "second operations" on headed blanks and screw machine products *in a completely automatic way.* Blanks are fed from a hopper and chucked in the spindle without the need of any operators except for the periodic filling of the hopper. Operations performed include *facing, chamfering, pointing, forming, drilling* and others in this class.

Townsend automatic machines do away with the necessity for tying up primary screw machines on second operation work; they also avoid the use of hand methods. Outstanding savings in time are the obvious results.

Townsend also manufactures a complete line of automatic second operation machinery for pointing and threading wood screws, slotting, cross-drilling and tapping. It will be to your advantage to explore thoroughly the extraordinary advantages offered in increased production and lower unit costs by the use of Townsend equipment. Samples and drawings examined and production estimates given at no obligation.

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TOWNSEND

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AMES PRECISION BENCH LATHE

Known for 40 years as a precision lathe of the highest quality. Bed 36" long. Ball bearing headstock uses 1" capacity collets. Swing 8 3/8" over bed. Available with motor drive.

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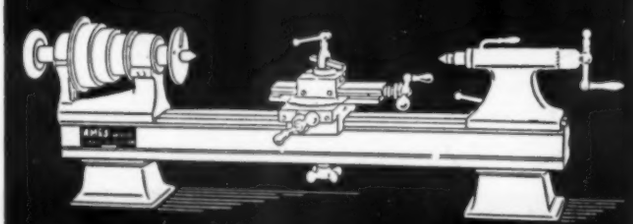

AMES PRECISION MACHINE WORKS
WALTHAM 54, MASS., U. S. A.

Severance CUTTING TOOLS

HIGH SPEED CARBIDE

MIDGET MILLS - ¼" Shanks

GROUND-from-the-Solid

ACTUAL SIZE

TEN LEADERS

MORE THAN 20 SHAPES—EACH IN SEVERAL SIZES

Obtain the best from the originator of GROUND-from-the-Solid

Severance JUNIOR MILLS-⅛"Shanks

GROUND-from-the-Solid

SET OF TEN

Practical for use on small grinders, for finishing Patterns, Dies, Parts, etc., in places difficult to reach with the larger Mills.

HIGH SPEED and CARBIDE

ACTUAL SIZE

Truly REVOLUTIONARY Cutting Tools

Severance LAB MILLS — 3/32" Shanks

Tungsten-Steel Solid

These speedy Mills for Dental Laboratories find many uses in Jewelry and in Die and Mold making. Available in 10 popular shapes in 4 or more sizes each, for the finest cutting and finishing. May be reground up to 8 times per 1/32" reduction in diameter

HIGH SPEED Out-Perform Dental Burs and Grinding Points

ACTUAL SIZE

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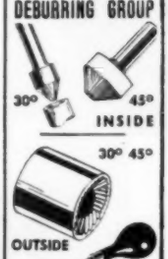
Complete REGRINDING Service — by New Tool Craftsmen — Savings are thus multiplied —

SEVERANCE TOOL INDUSTRIES, Inc.

726 Iowa Ave. Saginaw, Michigan

DEBURRING GROUP



30° 45° INSIDE

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SOLID (For Endless Lip)

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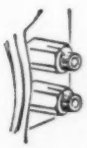
HEAVY DUTY

BALL SEAT REAMER

HOW THE BELLOWS AIR MOTOR *differs from* CONVENTIONAL AIR CYLINDERS

Bellows double-acting non-rotating BM-15 Air Motor

Quick, positive directional valve is an integral part of the cylinder



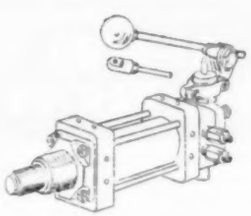
Speed control valves, also built-in, provide accurate control of traverse rate

Only one air connection required, which can be flexible hose

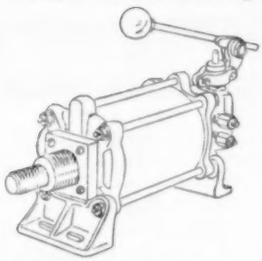
The Bellows Air Motor is a *different type of air cylinder.* It is a compact, reciprocating power unit, complete in itself. No extra directional valves or speed control valves are required. All controls are integral with the cylinder itself.

Its compactness, its simplicity of installation and operation, make practical the use of flexible, economical, "controlled-air-power" in an unlimited range of fundamental pulling, pushing and lifting movements.

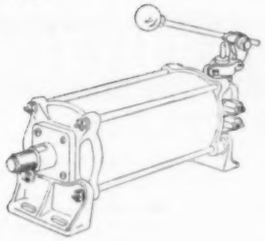
Four Power-rated Sizes
Manual, Mechanical, Electrical Valve Operation
All Standard Mounting Types • Standard Stroke Lengths 1" to 48"



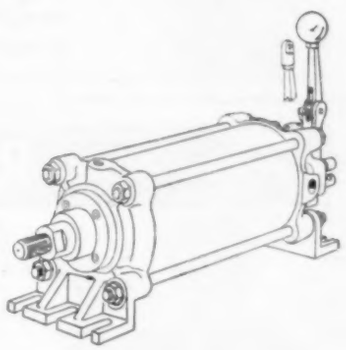
Model BM-1 (1¼" bore)



Model BM-5 (2½" bore)



Model BM-10 (3⅝" bore)



Model BM-15 (4½" bore)

Write for Bulletin BM22 and the new Foto Facts sheets showing cost-cutting installations of Bellows "Controlled-Air-Power" Devices.

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HALLOWELL Steel Collars

"Hallowell" Solid Steel Collars, attractively proportioned throughout, are precision-machined so faces run perfectly true . . . are also highly polished all over . . . yet they cost less than common cast iron collars. 3" bore and smaller are made from Solid Bar Stock and fitted with the famous "Unbrako" Knurled Point Self-Locking Socket Set Screw . . . a set screw that, once tightened holds and stays tight to make sure the collar won't shift on the shaft. "Hallowell" . . . a "buy word" in shaft collars are available in a full range of sizes for

IMMEDIATE DELIVERY

"Unbrako" and "Hallowell" Products are sold through Industrial Distributors.

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STANDARD PRESSED STEEL CO.

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HARDNESS TESTER

The *Scleroscope* is the only hardness tester that takes in the entire range from the softest to the hardest metals without any adjustments.

MODEL D-1 DIAL TYPE

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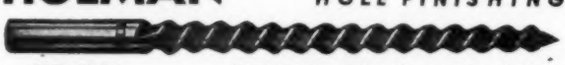

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Scientifically made of selected steel under modern processes. Long lived, economical, accurate. Details on request.

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Precision ROD CUTTING at High Speed

with the New DI-ACRO ROD PARTER

This newest member of the DI-ACRO "DIE-LESS DUPLICATING" family of Machines brings you accuracy, speed, capacity range and ease of operation fully up to the standards of DI-ACRO Benders, Brakes, Shears.

Do you require precision?—The DI-ACRO Rod Parter holds tolerance to .001" on duplicated cuts. The ends are square, and roundness is maintained.

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All hot and cold rolled rods • Stainless steel • Chrome Molybdenum • Aluminum Brass • Copper • Bi-Metals • Many types of plastics • Fibre • Rubber • Wood

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DI-ACRO PRECISION MACHINERY DIE-LESS DUPLICATING

O'NEIL-IRWIN MFG. CO.

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WE'LL SHOW YOU—

MEYCO
Carbide-Tipped
PLASTIC CUTTING CIRCULAR SAWS

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"More than 80,000 feet of plastic sheets have been cut and it looks good for as much again."

. . .

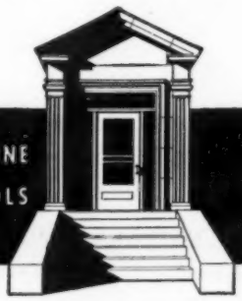
"This saw has parted 170,000 paper coils. The steel saws part approximately 6,000 per grind."

. . .

"It has increased tool life 28 times."

Here is a saw that will cut plastics—and keep on cutting for an unbelievably long time. Carbide's resistance to abrasion, coupled with engineering know-how in manufacturing fine cutting tools for well over half a century produced a circular cutting saw that will cut costs as well as plastics. Here is long life with a minimum of sharpening . . . filing eliminated altogether . . . a time and cost-saving circular saw that merits your investigation.

Write today for full information and prices (which will also surprise you).



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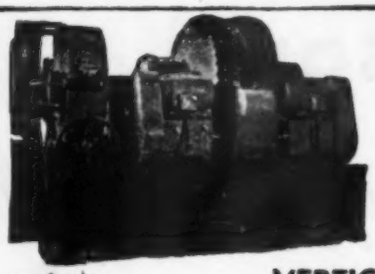
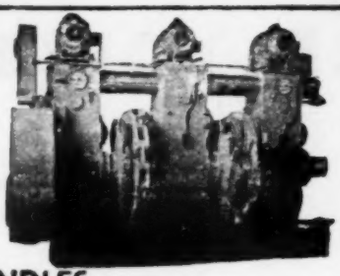


Roto-Matic MILLERS



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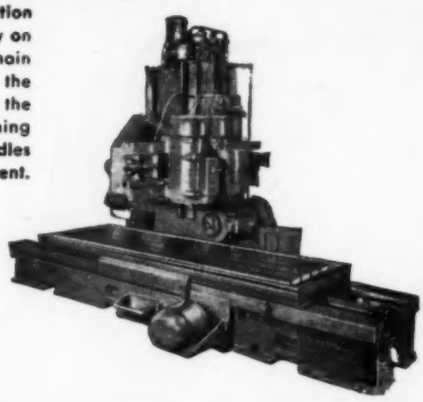
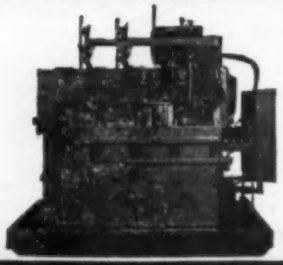
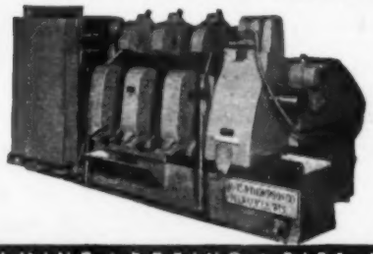
VERTICALS • SINGLE AND MULTIPLE SPINDLES
PLANERS • RISE AND FALL • VERTICAL INDEXING

The ROTO-MATIC principle of continuous production insures the maximum of production and accuracy on any job to which a Miller has been adapted. Chain clamping mechanisms, where adapted, leave the operator free to load and unload parts. On the larger type Rotary Drum Type Millers finishing spindles are adjustable for toe cut. All spindles have provisions for micrometric endwise adjustment.







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GSY-5

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M-5

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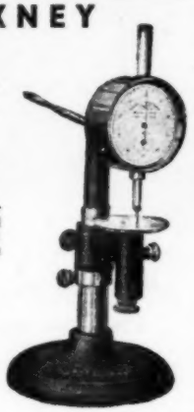

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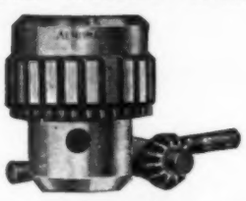

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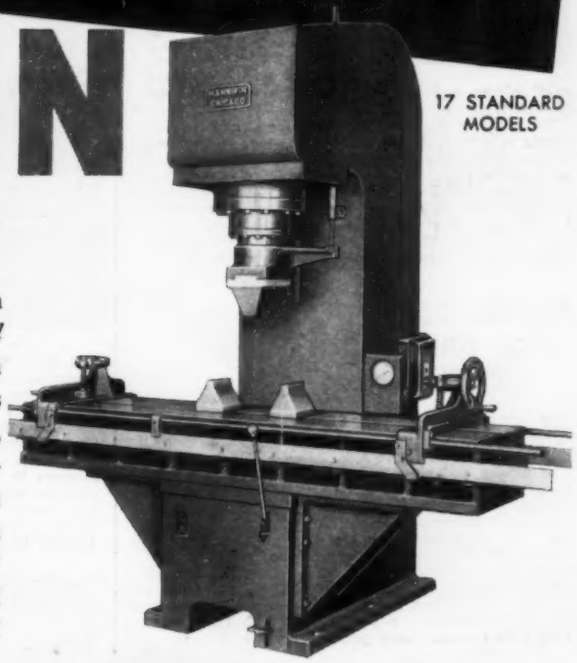

17 STANDARD MODELS

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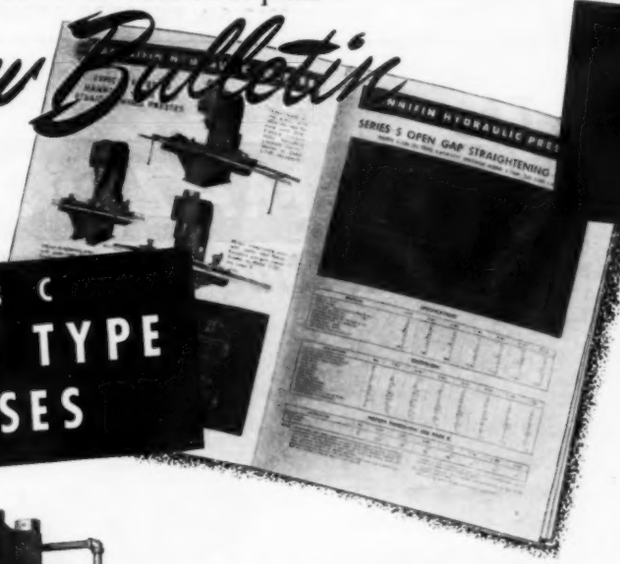
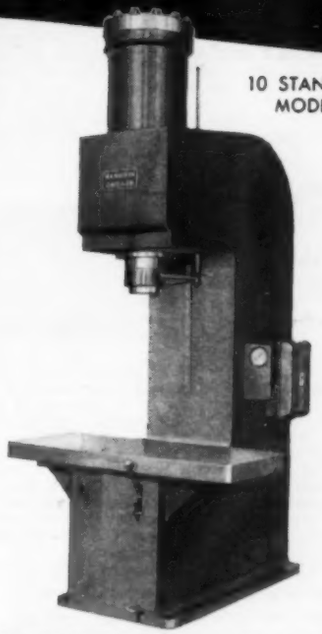
New Bulletin



SERIES F
FORCING PRESSES



10 STANDARD MODELS

SERIES C
COLUMN TYPE PRESSES

48 STANDARD MODELS

Lists *75* different standard models

● Get your copy of this new catalog! It contains detailed information on the design and construction of Hannifin's Standardized Hydraulic Presses together with specifications and dimensions for 75 different standard model presses. Ask for Bulletin No. 130-X.

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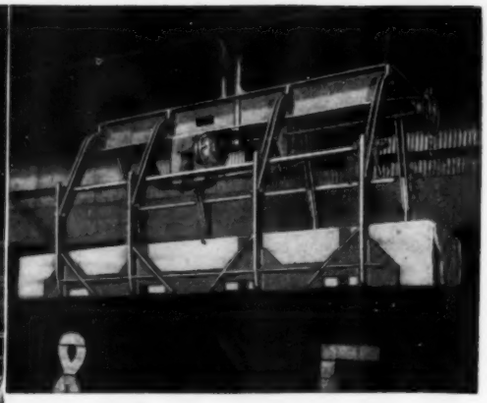

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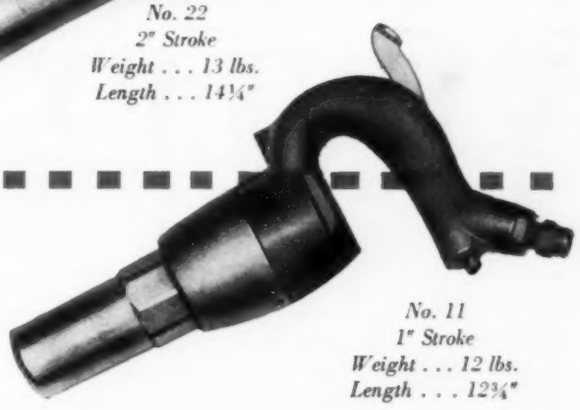

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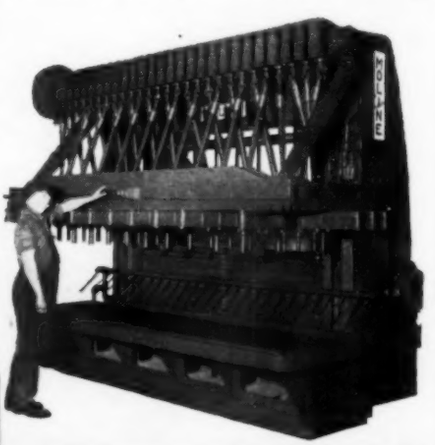

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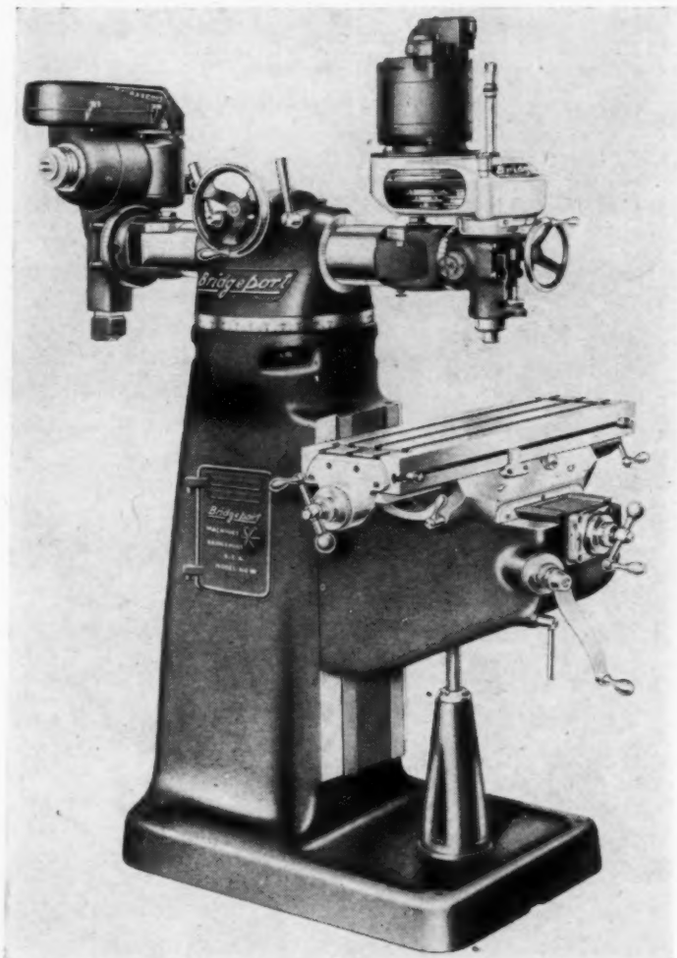

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6. Resistance to Shop Changes
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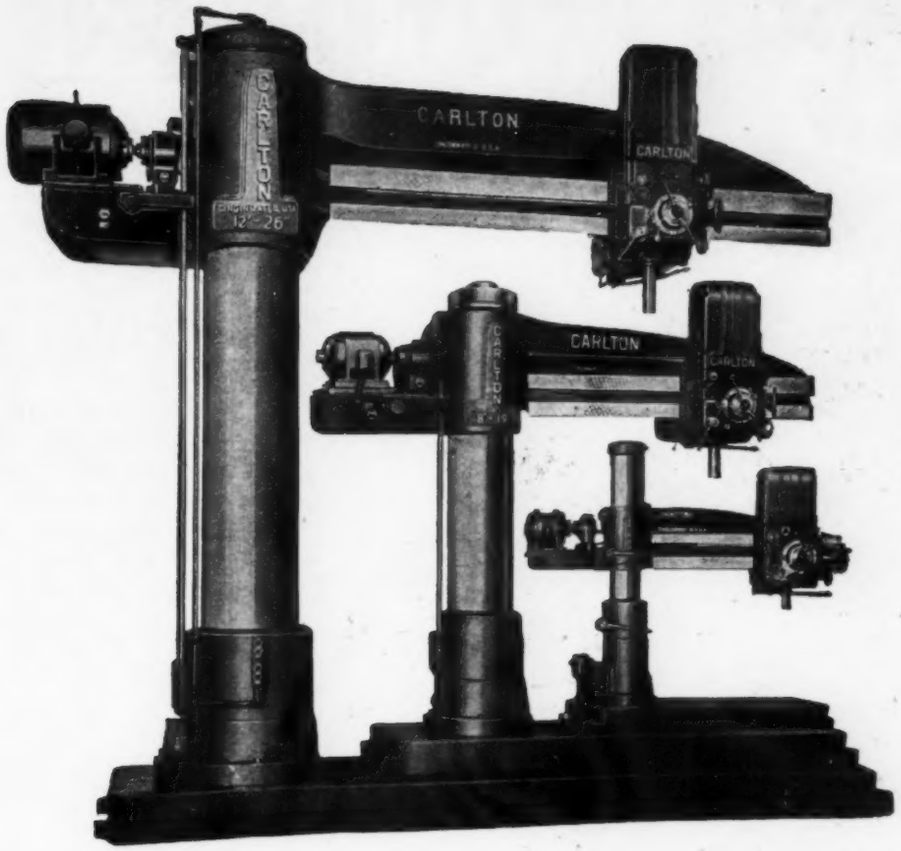

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Capacity under 10" Wheel	12"
Net Weight	2800 lbs.

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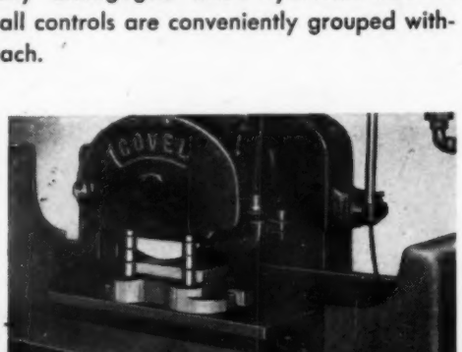

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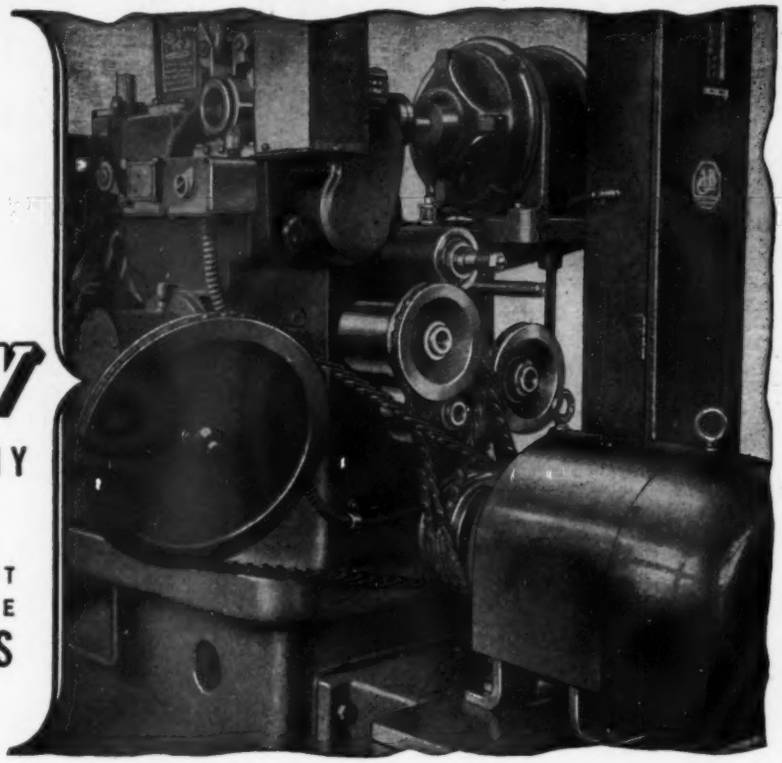

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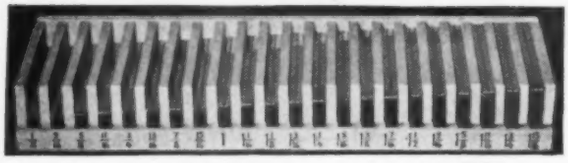

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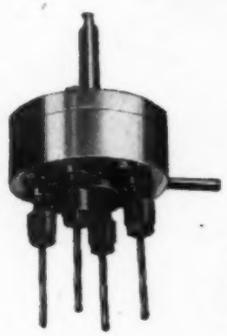

Four Spindle Fixed Center Drill Head

MULTIPLE SPINDLE HEADS

ALSO FIXED CENTER TAPPING HEAD AND ADJUSTABLE DRILLING HEADS FOR CIRCLES AND STRAIGHT LINES.

WRITE FOR COMPLETE CATALOG.

SEARCHLIGHT SECTION
AMERICAN MACHINIST
330 West 42nd St., New York 18, N. Y.

WHERE-TO-BUY USED MACHINE TOOLS AND SHOP EQUIPMENT

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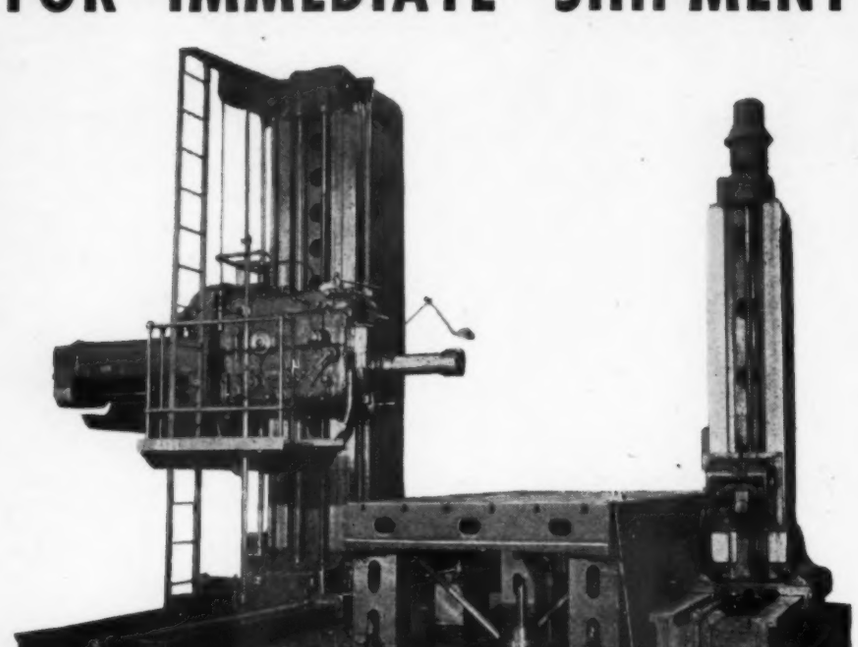
EASTERN OFFERS FOR IMMEDIATE SHIPMENT FROM STOCK



6" Bar Sellers Floor Type Horizontal Boring Mill, with a.c. motors. Machine has additional 2" high speed spindle. Complete with outboard support, 3 section floor plate, size 144x180". Has power rapid traverse to all units, precision thread cutting attachment with gears, complete with verniers and dial indicators, 7 boring bars, 2 face milling cutters, 1 boring head. Latest type machine, new in 1943.

AUTOMATICS

4 spindle ⅞" Cleveland Model M, m.d.
4 spindle 2" Cleveland Model M, m.d.
4 spindle 2¼" Cleveland Model K, m.d.
2¼" Cleveland Model A, m.d.
2¼" Gridley, m.d.
2½" Cleveland Model A, m.d.
4¼" Cleveland Model A, m.d.
4½" Cleveland Model A, m.d.
5½" Cleveland Model A, m.d.
6" Cleveland Model A, m.d.
7¾" Cleveland Model A, m.d.
No. 6A Potter & Johnston, m.d.
No. 6C Potter & Johnston, m.d.
14" Fay, Flanders Type, m.d.
20x25" Jones & Lamson, m.d., latest

HORIZONTAL BORING MILLS

6" bar Sellers Floor Type, with 2" additional high speed spindle, m.d., has floor plate 144x180", new 1943
3½" Cincinnati Gilbert Floor Type, m.d., with floor plate 8x10', latest type, new 1943
3½" bar Cincinnati-Gilbert Table Type, m.d., new 1943
2½" bar Cleveland, m.d.
No. 31 Lucas, m.d., 3" bar
No. 32 Lucas, m.d., 3½" bar
No. 33 Lucas, m.d., 4½" bar
4" bar Detrick & Harvey Floor Type, m.d.
4" Niles Table Type, old
5½" Niles Table Type, m.d.
10" bar Sellers Floor Type, m.d.
Morton 60" stroke Boring Mill and Traveling Head Planer, m.d.

BROACHING MACHINES

Oil Gear Hydraulic type XA, 64" stroke, 20 tons
Colonial VAS-5-42 Single Ram Hydraulic, m.d., latest
Cincinnati Mill Broach, 10" spindle, m.d., new
No. 75 HP LaPointe Horizontal Hydraulic, 150" stroke, 37½ tons cap., latest
No. 4 LaPointe of Hudson, gear box

VERTICAL BORING MILLS

24" Bullard New Era, m.d., with side head
24" Bullard Spiral Drive., m.d., with side head
36" Bullard Spiral Drive, m.d., with side head
36" Bullard Spiral Drive, m.d., with side head, high speed type, latest type
42" Bullard New Era, m.d., with side head
42" Bullard Spiral Drive, m.d., with side head
42" Colburn H.D., 2 swivel heads, m.d.
48" Cincinnati Rapid Production, m.d., 1 turret, 1 swivel head
48" Colburn, m.d., 1 turret, 1 swivel head
48" Putnam H.D., m.d., 2 swivel heads
54" Colburn H.D., m.d., 1 turret, 1 swivel head
84" Niles H.D., m.d., 2 swivel heads
100" Niles H.D., m.d., 2 swivel heads

UPRIGHT DRILLS

21" Cincinnati-Bickford, m.d.
28" Cincinnati-Bickford, m.d.
30" Rich H.D., m.d.
32" Aurora, belt
40" Aurora, belted m.d.
H#3 Barnes Hydram, m.d., late
D4 Colburn H.D., m.d.
D8 Colburn H.D., s.p.d.
No. 25 Foote-Burt H.D., m.d.
No. 36HO Baker H.D., m.d.

RADIAL DRILLS

3' American Sensitive, belt
4' Niles-Bement-Pond Semi-Universal, m.d.
5' American Triple Geared, m.d., 13" col.
5' Cincinnati-Bickford Full Universal, 13" col., gear box
5' Cincinnati-Bickford Plain, 13" column, m.d. on base
5' Cincinnati-Bickford Plate Hole Driller, m.d.
5' Prentice, m.d. on base
6'-15" Carlton, gear box on base
6' Cincinnati-Bickford, d.c. motor on base
6' Niles-Bement-Pond Semi-Universal, m.d.
6'-16" Western, m.d.
8'-16" American Triple Purpose, m.d. on arm
8'-19" American Triple Purpose, m.d. in arm, 1942 machine
10'-22" American Triple Purpose, m.d. on arm

HORIZONTAL DRILLS

No. 1B-50" Pratt & Whitney Deep Hole, m.d., latest
No. 1" Pratt & Whitney 2 spindle Deep Hole, belted m.d.
No. 1½x105" Pratt & Whitney 2 spindle Deep Hole, m.d., latest type
No. 1½ Pratt & Whitney 2 spindle Deep Hole, belted m.d.
Pratt & Whitney Rifling Machine, belt
5 spindle Detroit Semi-Automatic, belt

MULTIPLE SPINDLE DRILLS

No. 3 Baush, m.d., 16x30" head, 15 spindles
No. 16 Fixed Center Foote-Burt, m.d.
3 spindle 12" Rockford Gang, m.d.
4 spindle 21" Cincinnati-Bickford Gang, m.d.
4 spindle Foote-Burt Rail, m.d.
D13H Natco, head 18x12"

GEAR SHAPERS

No. 6 Fellows, belt
No. 7 Fellows, m.d.
No. 7A Fellows, m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 61 Fellows, belted m.d.
No. 61A Fellows, m.d., latest type
No. 64-S Fellows, m.d.
No. 615A Fellows, m.d., latest
No. 645A3 Fellows, m.d., latest
No. 71A Fellows, m.d.

GEAR GRINDING MACHINES

No. 13LS Fellows Lapper, m.d.
9" Pratt & Whitney Hydraulic Spur Gear, m.d.
10" Pratt & Whitney Hydraulic Spur & Helical, m.d.
No. 2HS Lees-Bradner Spur & Helical, m.d.

GEAR HOBBERS

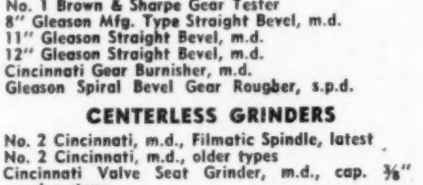
Type A Barber-Colman, m.d., latest
No. 12 Barber-Colman Double Overarm, m.d., long bed type
Barber-Colman Type T, m.d., latest
No. 34 Brown & Sharpe, m.d.
No. 44 Brown & Sharpe, m.d.
48" Cleveland Hobber, m.d.

GEAR CUTTERS

Cross Gear Tooth Rounder, m.d.
Gleason Testing Machine, m.d.
3" Gleason Straight Bevel Gear Generator, m.d.
3 spindle Gould & Eberhardt No. 36BM Vertical Gear Rougher, s.p.d.
No. 3-26" Brown & Sharpe Auto. Gear Cutter, m.d.
No. 6-60" Brown & Sharpe
No. 1 Brown & Sharpe Gear Tester
8" Gleason Mfg. Type Straight Bevel, m.d.
11" Gleason Straight Bevel, m.d.
12" Gleason Straight Bevel, m.d.
Cincinnati Gear Burnisher, m.d.
Gleason Spiral Bevel Gear Rougher, s.p.d.

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d., Filmatic Spindle, latest
No. 2 Cincinnati, m.d., older types
Cincinnati Valve Seat Grinder, m.d., cap. ⅜" valve stems



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THE EASTERN MACHINERY COMPANY
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EMCO

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MACHINERY COMPANY

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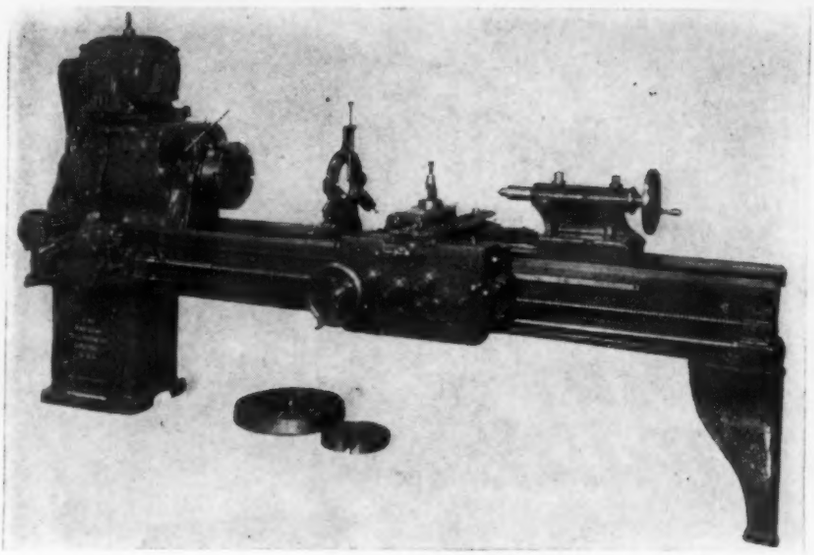


American Q.C.G. Selective Geared Head, 18"x10', Actual swing over ways—20", max. centers—72", Taper Attachment and 3/60/220/440 volts motor drive.

ENGINE LATHES

32"x28' Bridgeford, Geared Head
32"x16' Bridgeford, Geared Head
28"x10' Davis, Quick Change Gear
26"x18' Bridgeford Geared Head
24"x36' New Haven, Motor Drive
24"x22' Lodge & Shipley, Geared Head
24"x18' American Q.C.G. Grd. Hd. 11' centers
24"x12' Putnam, Quick Change Gear
24"x10' LeBlond, Quick Change Gear
20"x11' Schumacher-Boye, Q.C.G.
20"x10' American, Q.C.G.
20"x10' Hendey, Q.C.G motor dr.
20"x8' Lodge & Shipley, Q.C.G. M. Dr.
18"x10' American Geared Head
18"x10' Davis, Q.C.G. M. Dr.
18"x8' Lodge & Shipley geared head
18"x8' Hendey Q.C.G. 49" centers
18"x7' Lehman, Q.C.G. M. Dr.
18"x6' American, Geared Head, MD.
16"x8' Hendey, Q.C.G. M. Drive
16"x6' Lodge & Shipley Geared Head
14"x8' Rockford, Q.C.G. Collets
14"x8' Pratt & Whitney, Q.C.G. Collets
14"x6' LeBlond, Q.C.G. M. Drive
14"x6' American, Q.C.G. M. Drive
14"x6' Mulliner-Endlund, M. Drive
14"x6' Hendey, Q.C.G. M. Drive
14"x6' Rockford, Q.C.G. M. Drive
13"x5' South Bend Q.C.G. 30" centers
12"x30" American, Wood Spinning
12"x5' Sidney, Geared Head
12"x5' Hendey, Q.C.G. M. Drive
12"x5' Sebastian Q.C.G. Grd. Hd. 30" Centers
12"x3' Craftsman, Bench, M. Drive
11"x4' Sidney, Q.C.G. Floor Type
11"x4' South Bend Q.C.G. 20" centers
11"x3' South Bend, Q.C.G. M. Drive
10"x24" Logan, Q.C.G. (new) in stock
9"x12" Sundstrand Mfg. Type
8"x18" Rivett Precision, Bench
9"x15" Porter-Cable, Production

TURRET LATHES

Morey #2 Geared Head, 1" Cap.
Simmons, Microspeed, 1" Cap.
W-Swasey, Univ. #4, 1½" Cap.
Gisholt #4, Univ. 2" Cap.
W-Swasey #2A, Univ. 2½" Cap.
Gisholt #5, Univ. 2½" Cap.
W-Swasey #3A, Univ. 3½" Cap.
Bullard 42" Vert. Turret

PARTIAL LISTING
SEND US YOUR
INQUIRIES

POWER PRESSES

Clearing 200 Tons, S.S. 10" Stroke
Michigan O.B.I. 36 Tons Cap.—2" Stroke
General 8 Tons, Flexible Power Press, M. Dr.
Ferracute #EG52 Geared Coining Press, 150 Tons Cap.—Up Moving Ram
Baxendale O.B.I. 11 Tons, 1½" Stroke
Zeh & Hahneman, Single Action Cam Press, Spring Return Type—35 Tons Capacity

DRILLING MACHINES

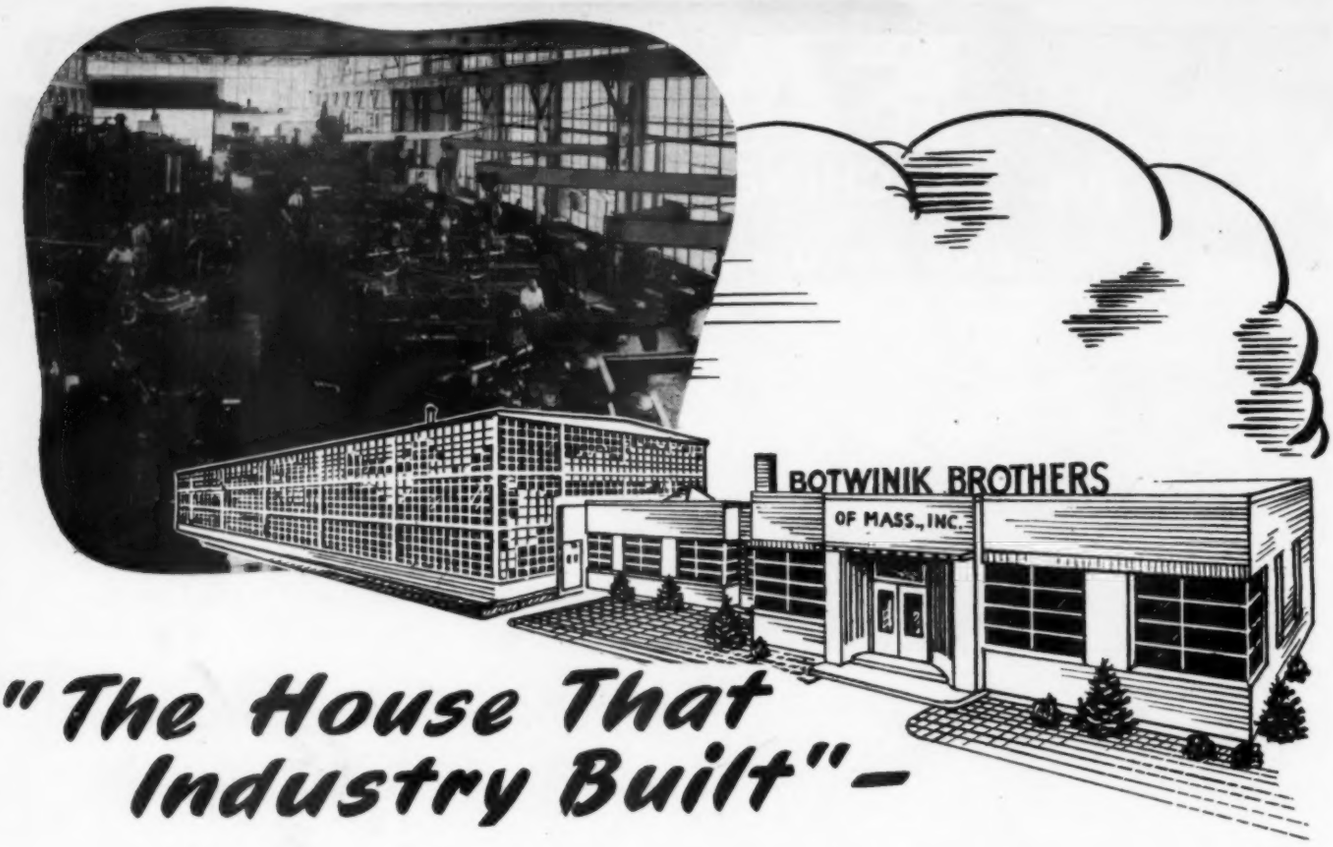
Natco #12, 20 Spdles. 3/16" Cap.
Natco #D6, 24 Spdles. 5/16" Cap.
Natco #D5, 14 Spdles. 5/16" Cap.
Fox #15, 54 Spdles. #1 m.t.
Minister #2D, Sgle. Spdle. Upright, compound table, #5 m.t.
Cinci.-Bickford, 3½' arm, 9" col. Radial
Cinci-Bickford, 4' arm, 11" col. Radial
Cinci-Bickford, 5' arm, 13" col. Radial
Fosdick, 5' arm, 14" col. Radial
Cinci-Bickford, 6' arm, 15" col. Radial

SHAPERS & PLANERS

Pratt-Whitney Vert. Shaper, 6", M. Dr.
Logan 7" Horiz. Shaper, Motor Drive
Machinery Sales 16" Crank Shaper
Gould & Eberhardt 16" Crank Shaper
Gould & Eberhardt 24" Crank Shaper
American 24" Crank Shaper
New Haven 12" Vertical Shaper
Whitcombe, 24x24x6 Planer
Niles-B-P, Shaper Planer, 20x20x24
Ingersoll Planer Type Mill 30x30x16
Betts, 120"x72"x35' Planer
Ingersoll Planer Type Mill, 30x30x12

AUTOMATICS

#0 & #00 Brown & Sharpe Full Automatic, Standard Speed
1—1¼" Cone 4-spindle Automatic, Motor Driven, Threading Spindle
1—#515 National Acme 9/16" 4-spindle Automatics, complete



"The House That Industry Built"—

which saves machine tool costs.

Firms country-wide turn to Botwinik for solutions to their machine tool problems and production ills. Machines on their floors which have outgrown their efficiency are turned over to our staff of trained engineers and master mechanics to be rebuilt, repaired, or redesigned to comply with exact specifications.

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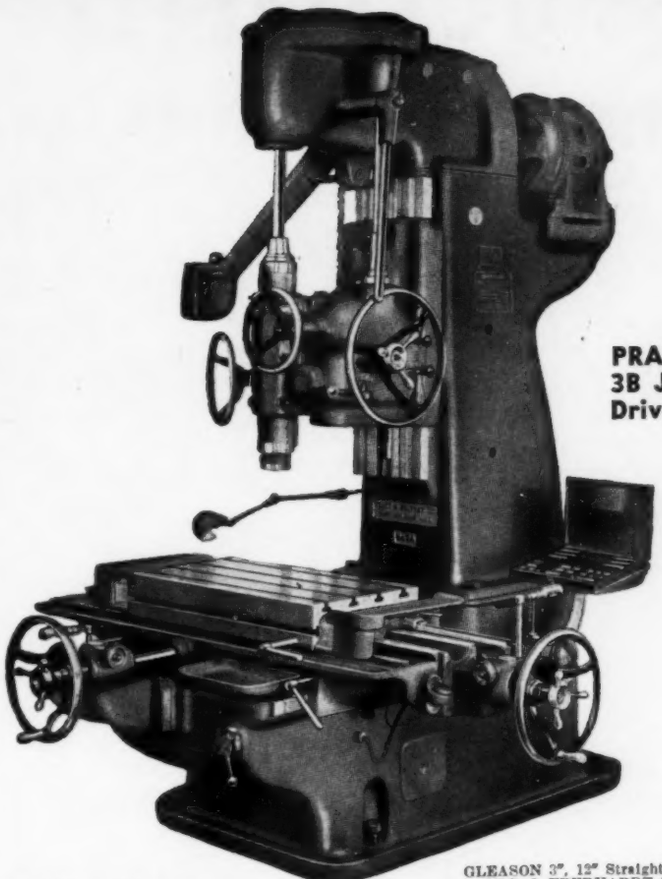
Watch each issue of American Machinist for samples of Botwinik's stock of used and rebuilt guaranteed machine tools—one of the country's largest.

Botwinik Brothers OF Mass., INC.

2 SHERMAN STREET • WORCESTER 1, MASS.

LATEST TYPE NEARLY NEW MACHINES



PRATT & WHITNEY 3B Jig Borer Motor Drive, Latest Type

BORING MILLS—Horizontal

DETRICK & HARVEY 4", 5" bar, Floor Type
GIDDINGS & LEWIS #32—3½" bar, M.D.
LANDIS #35, 3½" bar, Floor Type
LUCAS #31 3" bar, M.D.
MORTON 60" traveling hd., combination borer, miller and driller, M.D.
NILES BEMENT POND 4½" bar, Motor Drive
NILES BEMENT POND 5", 6", 7" bar, floor type, M.D.
UNIVERSAL 3" bar, latest type

BORING MILLS—Vertical

BETTS 120", 2 swivel heads, AC, M.D.
BETTS (Consolidated) 84"—3 heads, AC, Latest
BULLARD 16"—6 spindle Mult-Au-Matic—Type D—Single Indexing—Latest Type
BULLARD 24", 36" vertical turret, New Era Type, M.D.
BULLARD 24", 36" Ver. Turret, Spiral Drive, latest
KING 36" Vertical Turret, M.D., Latest Type
NILES 73", 100", swivel heads—PRT, Motor Drive

BROACHES

LaPOINTE #4L, Horiz. hyd., latest type
LaPOINTE #SRV-25-66, 10-54, Vertical Surface, hyd., latest type

DRILLS

AMERICAN 3½'9", 5'13" Radial, motor drive
BAUSH 4—Adjustable Multiple Spindle—M.D.
CINCINNATI BICKFORD 6'15" Plain and Universal Radial, motor drive
NATCO D5, Adj., mult. spdle, latest type
FOSDICK 6' arm 19" column Economax, Hyd. Radial, latest type
WESTERN 5'18", 6'20" Radial—Latest Type

GEAR CUTTING EQUIPMENT

BARBER COLMAN #3 Hobber, Latest Type
BARBER COLMAN #3 Hob Sharpener, Latest Type
BROWN & SHARPE No. 3H gear cutter, M.D.
FELLOWS 61, #64 615A, 645A3, 7, 7A, 72, 77, High Speed Gear Shapers, latest type
GLEASON 3", 12" Straight Bevel Generator, latest
GOULD & EBERHARDT 12H, 24H, 36H, 48H Hobber, latest type
GLEASON #7 Hypoid, Zerol, Spiral Bevel Generator, latest type
GLEASON 36" str. bevel gear planer, M.D.
GLEASON 11", 18" bevel generator, M.D.
GOULD & EBERHARDT 12HS Hobber, latest
PFAUTER #1, #2 with differential, M.D.
PRATT & WHITNEY 10" Grinder, hyd., latest

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, 3, 4, Universal, Latest
BROWN & SHARPE #5 Plain, 3x12, Latest Type
BROWN & SHARPE #20, 10x18 plain, 1 test type
CINCINNATI 6x18 plain Model EA, ER, hyd., latest
LANDIS 4x18, Type H, hyd., latest type
LANDIS 6x18, 10x18, Type "C", Hyd., Latest
LANDIS 30x220" Plain, Roll, Motor Drive
NORTON 16x72" Univ., Hyd., Type C, latest
NORTON 16x72" Plain Type "C", latest type

GRINDERS—Surface

ARTER 30" Rotary Surface—Hyd.—latest type
BLANCHARD #11—16" chuck, Latest Type
BLANCHARD #16—24" chuck, Motor Drive
BLANCHARD No. 16A—Dial Type—motor drive
BLANCHARD #27-18 M.D., Latest Type
GALLMEYER & LIVINGSTON #35, 8x24" Hyd., latest
GALLMEYER & LIVINGSTON #55, 12x36" hyd., latest
HANCHETT Series 300—12x48 hyd., vert. spdl., latest
HEALD #22, 12" chuck, Rotary, latest type
HEALD #25A Rotary 16" chuck Hydraulic, latest type
MATTISON 12x14x60 Hydraulic, latest type
MATTISON 14x16x60 Hydraulic, latest type
MATTISON 20x24x72 Hydraulic, latest type
NORTON 6"x18"—Hyd.—Latest Type
NORTON 10x36 Hyd., Latest Type
THOMPSON 8x12x24 Hyd., latest type
THOMPSON 16x30x48 Hyd., Latest Type

LATHES—Engine and Mfg.

BETTS BRIDGEFORD 60"x24' bed, swing 84"
BRIDGEFORD 36"x28', 36"x32' bed—2 car., M.D.
HENDEY 14x8' geared, Engine, M.D.
JONES & LAMSON "Fay" 20x25" automatic TIMKEN, latest type
LEBLOND 17"x5', 20"x10' bed, Rapid Production, Timken Bearing, latest type
LEHMAN 16x30, hydratrol, Timken, latest type
LODGE & SHIPLEY 18"x72" centers, motor drive
LOSWING 4x60, 4x84, 8x60, 8x108, 5x34" centers, latest
MONARCH 10x20" centers, Model EE Timken, latest
MONARCH 16x28" centers, geared hd., M.D.
MONARCH 12"x30" centers, Timken, Latest Type
NILES 42"x60", double head, motor drive
NILES 48x35' centers, Heavy Duty, 2 carriage, Timken Bearing, PRT, Latest Type
NILES 48x32' centers, 2 carriages, MD
NILES 48x63' centers, Combination Boring & Turning, MD
NILES 48x87' centers, Combination Boring & Turning, MD
NILES 60x10', 35', centers, 1 or 2 carriages, Timken Bearing, PRT, Latest Type
NILES 72"x62', centers, combination Boring and Turning, Motor Drive
NILES 30x50' Boring, Timken, Latest Type
REED PRENTICE 16x24" centers, geared hd., M.D.
SPRINGFIELD 16x43" centers, geared hd., M.D.
SPRINGFIELD 16x24" centers, geared hd., M.D.
SUNDSTRAND 8x15", 12x22" stub, automatic, TIMKEN, latest type
WARD HAGGAS & SMITH 18/36"x10' bed, Gap

LATHES—Turret

BARDONS & OLIVER #5, #7 Timken, latest
CINCINNATI ACME No. 1, No. 5W, Latest
GISHOLT #3, 4, 5, Univ., Timken, Latest
GISHOLT #1L, #2L, Universal, Timken, Latest Type
JONES & LAMSON #3, 7C, 8A, Universal, Timken Bearing, Latest Type
LIBBY 1H-5, 5⅛ hole, Timken, Latest
MOREY No. 2G, No. 3, No. 4 Timken, latest
POTTER & JOHNSTON #5D2E, TIMKEN, latest
WARNER & SWASEY 3A, Universal 6" bar capacity, Timken Bearing, Latest Type
WARNER & SWASEY #5, Univ., Timken Bearing
WARNER & SWASEY #1A, 4A, Univ., Latest Type

MILLING MACHINES—Mfg.

CINCINNATI 3-24 Duplex Hydromatic, latest type
CINCINNATI 24", 48" duplex, TIMKEN, M.D.
INGERSOLL 32x30x12' Planer Type Slab, AC, MD
INGERSOLL 32x24x16' Planer Type, 2 heads, AC, M.D.
TAYLOR & FENN M-80 Duplex, Spline, latest type

MILLING MACHINES—Plain

BROWN & SHARPE #3B Timken, latest
BROWN & SHARPE #12 Timken Bearing, latest
CINCINNATI #4, Timken Bearing, Motor Drive
CINCINNATI #48, motor drive
CINCINNATI 1-12, Timken, latest type
CINCINNATI 4-36 Hydromatic, latest type
CINCINNATI #2, 4 Dial Type, Timken, latest
CINCINNATI 0-8 Automatic rise and fall, Timken, Latest Type
KEARNEY & TRECKER #2K Timken, latest type
KEARNEY & TRECKER #4 heavy, Timken, latest
KEARNEY & TRECKER 1218, 1224, simplex, TIMKEN, latest type
KEMPSMITH #2, #4 Maxi-Mill, Timken, latest

MILLING MACHINES—Vertical

CINCINNATI No. 3, No. 4 High-Powered, M.D.
CINCINNATI #2, 3, 4, Dial Type, Timken, latest type
GORTON 8D high speed with duplicator, latest type
GORTON 9J superspeed, with duplicator complete, latest type
REED PRENTICE #5 die sinker, latest type
REED PRENTICE 3VG with Hydraulic Duplicator, Timken Bearing, latest type

PLANERS

CHANDLER 36x36x20', 4 heads, AC, M.D.
DETRICK & HARVEY 48x48x16', 4 heads, Hyd.
DETRICK & HARVEY 84x84x18', 4 heads, AC, M.D.
NILES BEMENT POND 48x48x16', 2 heads, AC, M.D.
OHIO 42x42x20'—2 heads, AC, M.D.

SHAPERS

LAMAIRE 18' Vert. Hydraulic—latest type
LYND FARQUHAR 26" Openside, Motor Drive
MOREY 8", 10", 12", 14" Vertical, latest type
MORTON 48" Draw Cut, Motor Drive
PRATT & WHITNEY 6' 10" Vertical, M.D.

MISCELLANEOUS

BARNES #172, Vertical Hone, Latest Type
BILLINGS & SPENCER 1500 pound drop hammer
BIRDSBORO 325 ton vertical hyd. press, latest type
CLEARING Type DS-1125-32 double action Press 125 ton-75 ton, latest type
FERRACUTE DG-55, 75 ton Drawing Press, Tie Rod, 17" stroke, Latest Type
GISHOLT 3U Dynetric Balancer, latest type
JONES & LAMSON 6x15", 8x48" thread grinder, latest
LANDIS 1" Bolt Threader—Latest Type
MORTON 60" combination traveling hd., planer, miller and borer, M.D.
PRATT & WHITNEY "Keller" Type G, Type BL2416—Latest Type
QUICKWORK Rotary Shear, ¾ cap., M.D.

Available for Prompt Shipment ***Most Built After 1941***

(Partial List) Over 2,000 Machine Tools in Stock. Your Inquiries Are Invited . . . Prompt Service Is Assured

MOREY MACHINERY CO., INC.
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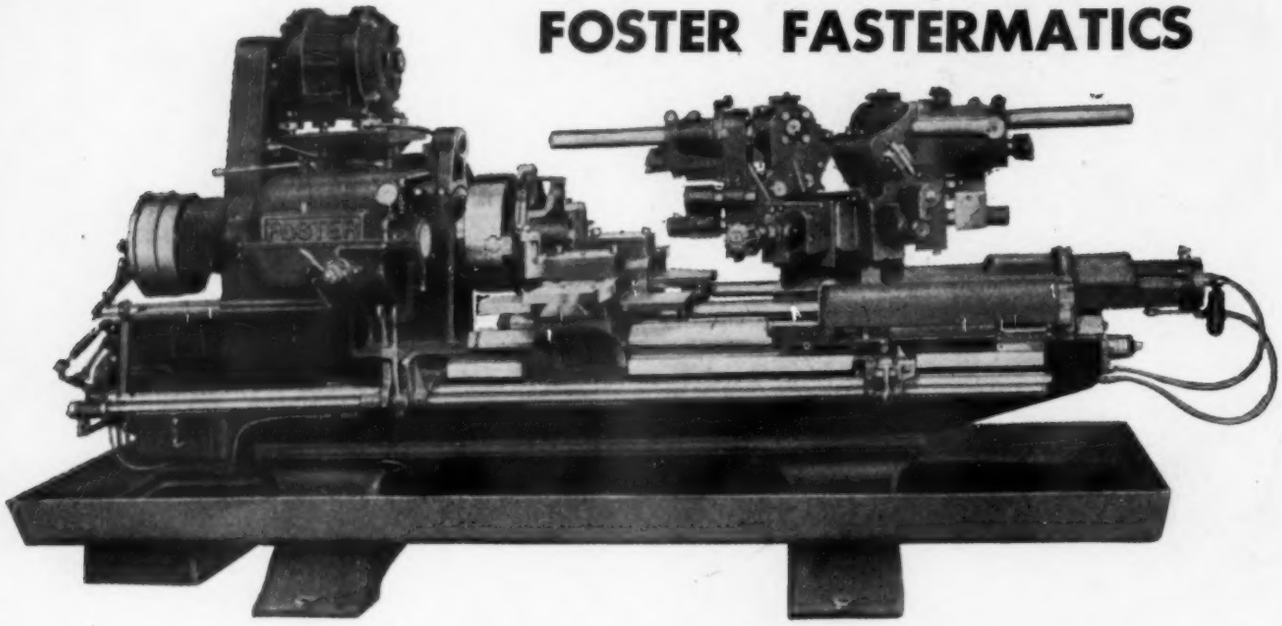
HIGHER PRODUCTION BULLETIN 129

TOOLS FOR PRODUCTION!!

FOSTER FASTERMATICS



ARE YOUR JOBS SIMILAR TO THESE: Gear blanks, bearing sleeves, shafts, large sprockets, ring gears, retainer rings, steel hub caps, cylinders, chuck bodies, bell housings, fly-wheels.

AVAILABLE FOR IMMEDIATE DELIVERY

#1F, swing 21", spindle speeds—27

#3F, swing 27½", spindle speeds—12

#4F, swing 35", spindle speeds—12

PRODUCTION GRINDERS

BRYANT INTERNAL GRINDERS

24-26; 24-L-36; 16-38; 16-AM-38; 24; 3.

HEALD

INTERNAL GRINDERS

22; 25A; 60; 72A3; 72A5.

BLANCHARD

SURFACE GRINDERS

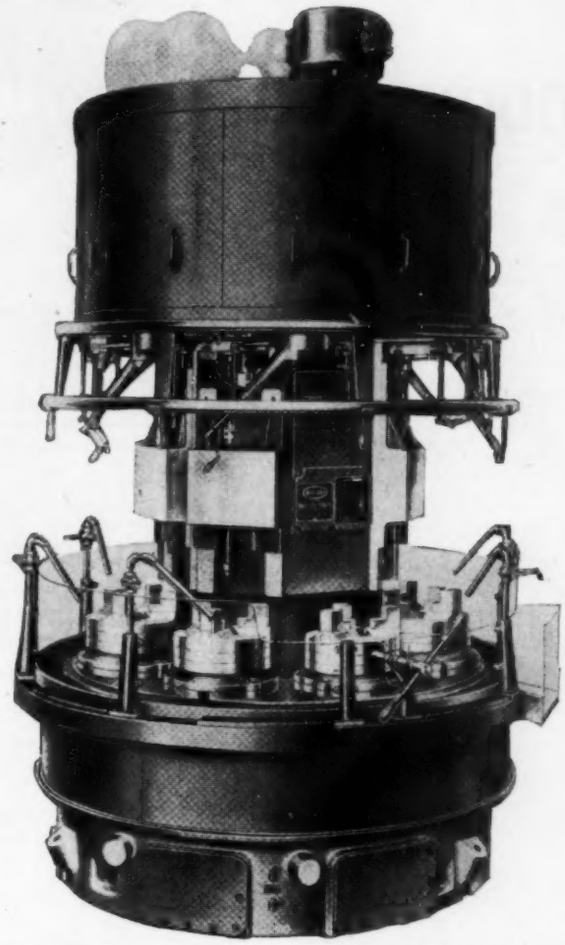
#16—30" chuck

#16—36" chuck

EMERMAN MACHINERY CORP.

875 W. 120TH STREET — CHICAGO 43, ILLINOIS

QUALITY *Machine Tools* NOW IN STOCK



Bullard Mult-au-matic, 16″ Type D, six spindle, single index, with four plain vertical heads and one double purpose head; complete with motors and controls. Late model.

AUTOMATICS

2G Brown & Sharpe, H.S. 1½″ capacity. New in 1943.
9/16″, 1″ & 2⅝″ RA-6 Acme-Gridley. New in 1943.
1⅝″—8 spindle Conomatic. New in 1942.
5¼″ Cleveland Model A, single spindle.
16″ x 33″ Fay Automatic Lathe. 1941.

BROACHES

No. 2SL LaPointe Hydraulic Horizontal. New in 1942.
No. CPC 6-36 LaPointe Hydraulic Vertical. New in 1943.

DRILLS

4′ 11″ Carlton Radial. New in 1943.
6 Ft. American radial 17″ column.
★ **No. 26HO Baker Hydraulic, single spindle, 3″ capacity in steel, with motor and control. Latest type.**
42″ Cincinnati-Bickford, single spindle.
No. 3 Avey, three spindle, heavy duty.
No. 3 Baush Multiple Spindle.
Barnes Horizontal Deep Hole, 2 spindle.
Taft Peirce Horizontal, double end.

GEAR CUTTERS

No. 16H Gould & Eberhardt Universal Hobber. Latest type.
No. 7A, 7125A Fellows Gear Shapers.
No. 615A, 645A, Fellows Gear Shapers.
No. 12 Barber Colman Hobber.

GRINDERS

No. 2 & No. 3 Cincinnati Centerless, Filmatic spindle. 1941.
14″ x 48″ Cincinnati Universal, Filmatic bearing, internal spindle. New in 1942.
10″ x 36″ Landis Hydraulic. New in 1943.
6″ x 18″ Cincinnati Hydraulic, Filmatic spindle. New in 1943.
No. 3 Brown & Sharpe Universal. New in 1943.
No. 18 Blanchard, 30″ chuck. 1942.
14″ x 16″ x 60″ Mattison Surface.
6″ x 18″ Thompson Surface Grinder. New in 1942.
16″ x 48″ Thompson Surface Grinder. New in 1943.
No. 75A Heald Internal. New in 1943.
No. 72-A-3 Heald Sizematic. New in 1943.
★ **No. 74 Heald Internal Grinder, with 6 foot extension on bed for long work, adjustable work headstock on swivel table for long tapers.**

LATHES, ENGINE

American Pacemaker, 16″ x 30″.
Lodge & Shipley 20″ x 48″. New in 1943.
★ **Bertram 28″ x 240″ "Timesaver", two carriages, with rapid traverse. Canadian made from Niles patterns. 1942.**
Lodge & Shipley 48″ x 54″, cone driven.
Carroll Jamieson 18″ x 5′, C.D.
LO-Swing, IMP & LR.
South Bend 14½″ x 6′, c.d.
Lipe Carbomatic, 15″ x 30″.
LeBlonde Production, 17″ x 30″.

LATHES, TURRET

Warner & Swasey No. 4A.
Warner & Swasey No. 2A, preselector. New in 1943.
Warner & Swasey No. 1A, preselector. New in 1940.
Gisholt No. 1L, hydraulic speed selector. New in 1943.
Warner & Swasey No. 5 Universal. 1943.
Gisholt No. 5 Universal, Hydraulic speed selector. New in 1944.
Foster No. 5 Universal, Bar feed. 1943.
Warner & Swasey No. 4 Universal, preselector. New in 1943.
Gisholt No. 4 Universal, Hydraulic speed selector.
Warner & Swasey No. 3 Universal, two speed. New in 1942.
Bardons & Oliver No. 3 Universal, motor in base. New in 1941.
Warner & Swasey No. 2, oversize. 1942.
Bardons & Oliver No. 2 bar feed. 1941.
Brown & Sharpe No. 1, M. in B. 1941.
★ **Bullard New Era VTL, 36″ x 42″.**

MILLS

Cincinnati No. 2MH Universal. New in 1942.
Van Norman No. 2SU Universal.
Gorton No. 9J Vertical, with tracer.
Cincinnati No. 2MH Plain, latest model.
Cincinnati No. 5 Plain. New in 1944.
Cincinnati Vertical, No. 3 Med. S. Dial.
Milwaukee Vertical, No. 2H. New in 1942.
Cincinnati No. 0S and 2-18 Rise and Fall.
Cincinnati No. 1-12 Automatic.
Cincinnati No. 4-36 Hydromatic.
DeVlieg Supermill No. 31B Sundstrand Electromil No. 2.
Whitney Hand Mill, No. 6.
★ **72 Betts Vertical Boring Mill, two heads, DC drive with AC/DC generator. New in 1943.**

MISCELLANEOUS

No. 5B Standard OBI Press. New.
No. 7 Kling Punch, 1¼″ through 1″, 72″ throat.
No. 8-6 Zeh & Hahneman S.S. Geared Press.
Pratt & Whitney Profiler, No. 12D.
Tapper, Leland Gifford 3′ Radial, No. 3 MT. New in 1941.
24″ Cincinnati Worm Feed Rotary Table.

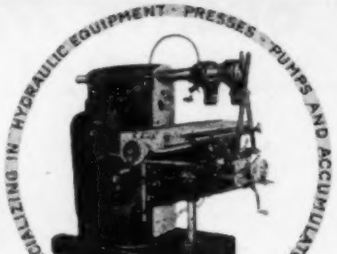
PLANERS AND SHAPERS

American Planer, 24″ x 6′, m.d.
Cincinnati Planer, 42 x 42 x 20, D.C.
Cincinnati 20″ Shaper, Universal table. New in 1943.
Cochrane & Bly No. 14 Vertical Shaper. New in 1942.
Pratt & Whitney 6″ Vertical Shaper. New in 1943.

ALL MACHINES MAY BE INSPECTED UNDER POWER IN OUR WAREHOUSE

INDIANAPOLIS
MACHINERY & SUPPLY CO., INC.
High Quality NEW, USED & REBUILT Machine Tools
1961 S. Meridian St., Indianapolis 6, Indiana
EASTERN BRANCH: 44 WHITEHALL ST., NEW YORK
MEXICO OFFICE: HIDALGO ORIENTE 2-535-B, MEXICO, D.F.

AARON VALUES IN MODERN TOOLS



MACHINE TOOLS

SPECIALS

P & W #2A Jig Borer, New 1945
Clearing 90-10 Press Brake—10' 10 Ga.

Fosdick 24" Sliding Head, Box, Late
56 Ton Thomas OBI Press, New 1947
Gorton Duplicators and Vert. Millers
Gorton No. 3Z, ID, ME Engravers
Norton, Denil Surface Grinders 8"x24"
Marvel 6A Hacksaw, M.D., Auto, Feed
Injection Moulders, Hydraulic Presses
Norton No. 2 Tool & Cutter Grinder, late
Bakewell No. 1 Tapper
Sellers Wet Drill Grinder 6G, late

BORING MILLS

#0 Giddings & Lewis arr. M.D.
2½" Cleveland arr. M.D., 2½", 4" Binsee
Niles-Bement-Pond 4" duplex, Universal 3"
66" Niles; 54" Colburn M.D. 2 hds.
Bullard New Era 24", 42", Vert. M.D.

TURRET LATHES

W. & S. Nos. 3, 4 Grd. Hd., Preselector
Gisholt No. 1L, 2L Univ. M.D., Late
Foster Nos. 4, 5, 6, 1B, 3B M.D. Univ.
J. & L. 2¼"x24", 3¼"x36"
Acme #2 M.D.
Oster 601 Rapiduction, Late
Hardinge ESM, 2nd operation, late

GRINDERS

Abrasive 3B 8"x24" Surf., #34 Vert.
#25 Gallmeyer & Livingston Hyd. Surface
#25A Heald, M.D. like new Rotary Surf.
No. 2 Cincinnati Centerless M.D.
B. & S. No. 2, 2B Surface, M.D.
P. & W. 14", B.B., Vert. Surface 19"x49"
Blanchard 30", M.D.; Modern 12x48" M.D.
Norton Hydraulic 12x18", M.D. Cyl.
Heald No. 72A3 Gagematic
Norton 50"x28' M.D. Roll Grinder
Landis Type A 6x20" Hydraulic, M.D. Cyl.
No. 55, 60, 65 Heald Int., M.D.
12" Heald Rotary, Arter 12" M.D.
B. & S. No. 10, 11, Cyl.; 1, 3 Univ.
Norton 6x18", Hyd. Surface, M.D.
Covel #91A Tool, New 1941, Cinn.
Hammond & Excello Floor Model

LATHES

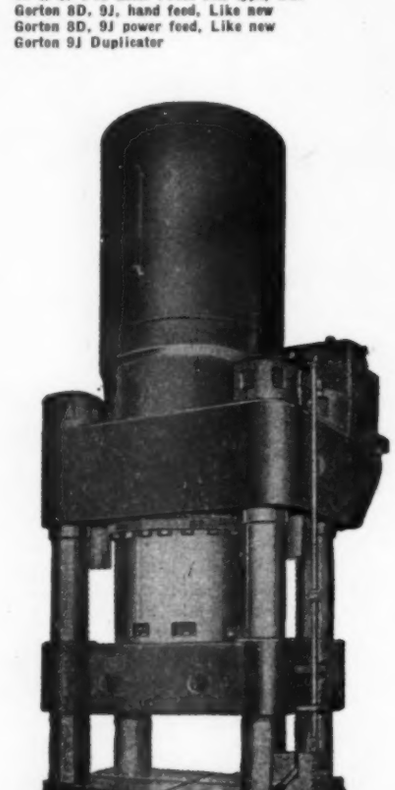
24"x12' Springfield Grd. Hd., late
Monarch, Hendey 12x30, 10x20 G.H. Late
26x12' Boye & Emmes 3 step cone D.B.G.
14"x6' Hendey Taper, Collets 16"x6'
9" LeBlond P&W 1"x18" Automatic
36x30' Putnam M.D., 36x22', 42x16
32"x35' Wickes, M.D.
20"x30' Boye & Emmes Grd. Hd., Late
South Bend, M.D., T.A., 16"x10', 9"x3'
Sundstrand Centering Machine #36, 6"x54"
Sebastian 12"x4' grd. hd. late
Wade, Hjorth, Hardinge, P & W Precision Bench

AUTOMATICS

Cone 8 spindle, 1⅞" Late
Cleveland Model A ⅞", 1¼", 2"; B 1", 2", 3⅛"
Cone 4 spindle, Gridley
Brown & Sharpe #4, 6 Auto, #2 Hand

MILLING MACHINES

Cinn. #3 Pl., #4 Vert. Dial Type, Rect.
3B K. & T. Dbl. Overarm
Cleveland Vert. No. 1 M.D.; #1 Univ.
#2B K & T Univ.; No. 2A B & S Univ.
No. 3B Cincinnati, S.P.D. rapid trav.
Nos. 0Y, 2, 3, 4, 5 B & S Plain & Univ.
Hall Planetary Model D Thread Miller
Becker Nos. 3, AB, 5, 6 Vert.
Nos. 2, 3, 4 Cincinnati Vert.
P. & W. No. 12, 30" Profiler, M.D.
B. & S. No. 1, 3 Vert.
B. & S. #12 Elec. Prod. late type, #21
Gorton 8D, 9J, hand feed, Like new
Gorton 8D, 9J power feed, Like new
Gorton 9J Duplicator



1300 Ton Watson Stillman Hydraulic Press

NEW IN STOCK

Power Shears—52", 72" & 96"

Spot & Arc Welders
5, 7, 14, 18 & 30 ton OBI Power Presses
Ammco 7", Shape Rite 8", Shapers
H.S. Vertical Milling Heads
Drill Presses, Foot Presses
Kalamazoo Metal Band Saws
No. 1½ Abrasive Wet Surface Grinder
6x6" Racine Hacksaw; #8 Marvel
20 ton Northern Hydraulic Presses

RADIALS

4' Fosdick 13" col., 8' Carlton, 19" col. M.D.
6' Cincinnati-Bickford
4', 5', 6' American Triple Purpose
Canedy-Otto 3'11" Col. M.D. on Spindle, Walker-Turner, ½" cap.

HYDRAULIC EQUIPMENT

1300 TON WATSON STILLMAN HYDRAULIC PRESS Self Contained

Platen size 48"x42". Stroke 22". Opening 46". Ram Diameter 35". Driven by 50 H.P. motor, also.

600 TON SOUTHWALK PRESS

Self contained 48"x48" platen size, 65" stroke, 110" opening, 50 H.P. motor, 3 phase, 60 cycle, 220v.

1000 TON H.P.M. PRESS

Self Contained

Platen 72"x48". 36" stroke. 36" opening 40 H.P., 3 phase, 60 cycle, 208-416 V motor.

1140 TON SOUTHWALK PRESS

Not Self Contained

Platen 11' 11" left to right, 11' front to rear. 48" stroke. 60" opening.

2000 TON BIRDSBORO PRESS

Self Contained

60" between rods left to right, 53" front to rear. Overall length of platen left to right 144". Stroke 30". Opening 36". 125 H.P., 3 phase, 60 cycle, 220-440 V motor.

All Hydraulic equipment is completely engineered and checked by a competent staff, thus assuring reliability. Send us your hydraulic problems.

MISCELLANEOUS

Mitts & Merrill, Davis Keyseaters
Wiedman Turret Punch—Type R4P
Buffalo #0 Angle Roll M.D.
Bliss #58-OB Gap Presses, 62, 62A, 162
6" Vertical Shaper, P & W
10x10 Peerless Universal Shaping Saw
#7, 72 Fellows Gear Shapers
Pexto 6' Power Shears
Burke & Nichols Millers, Pl. & Univ.
Delta Single & Multiple Drills
Deckel G1, G2, GIF Engraving machines
Hanson-Whitney Thread Miller
Oliver Heavy Duty die making machine
J & L bench comparator; Zeiss Shadowgraph
Taylor-Winfield 50 KVA Spot Welder
Leland-Gifford 1, 2 & 4 spindles, Model MS

AAron Machinery Co., Inc.

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DI. 9-1766 CABLE—AARMACH

MONA MEMBER

Miles Quality Tools

AUTOMATICS

12" Bullard Mult-Au-Matics, 6 station, Type D
2⅝" Acme Gridley 6 spdl., RA6
2" Cleveland model B, 18" feed
1⅜" Cleveland 4 spdl., model M
⅛" & 1¼" Cone 4 spindle
No. 454 New Britain chucking
12"x63", 14"x19" & 16"x33" Fay
1" Economy shaver or turner
14"x19" Monarch Magnamatic lathes
6", 8", 10" & 15" Sundstrand auto, stub

BORING MILLS

3⅛", No. 0 Giddings & Lewis
3½" Universal
4¾", No. 300 Giddings & Lewis floor type
7" Barrett cylinder
24", 36" & 42" Bullard vertical
53" Niles Bement Pond
96" Cincinnati Massive
100 Niles Bement Pond Heavy
Vernon jig borer
No. 1212 Excello double end borers

BROACHES

No. 1 Foote Burt duplex surface
9 ton American horiz. hydr. surface
Twin 10 & 3XA Oilgear
No. 25 LaPointe
30 ton No. V48 American vertical
No. 2 Standard screw press

DRILLS, UPRIGHT

20" No. 2 Colburn 1 & 4 spindle
21" Canedy Otto (New)
21" & 24" Cincinnati Bickford
24" Kokomo
Nos. 121, 217, 314, 315, & 321 Baker
No. 217 Baker 3 spindle
22" Barnes 2 spindle All Geared
24" No. 25 Foote Burt
24" No. D 2 Colburn
26" Barnes No. 262 box column

DRILLS, SENSITIVE

12" Avey 4 spdl. Size ½H type C
12" No. 0 Avey high speed
12" No. 1 Leland Gifford, 1 & 2 spdl.
14" No. 2 Leland Gifford, 1 & 2 spdl.
15" No. 2 Avey hydraulic feed
16" No. 3B Edlund
16" Henry & Wright, 1 & 2 spdl.
18" No. 18 Canedy Otto, New
16" 4 spdl. Allen type 2 KH
16" Foote Burt 6 spdl.
24" Henry & Wright No. 3, 2 spdl.
24" No. 3 Aveymatic 2 spdl., P.F.
24" Demco 4 spdl., No. 3 taper

DRILLS, MISCELLANEOUS

3'9", 4'9" & 6'15" Cint. Bick, radial
42 spindle No. B16 Natco multiple
34 spindle No. 30 Natco multiple
22 spindle No. 14 Natco multiple
8 spindle No. 11 Natco multiple
24 spdl. Natco Hole tapper No. V1
24 spindle No. 2 Baush multiple
No. 4HH Baker two way
36 spdl. Baush horiz. 2A
Foote Burt 3 way multiple
Munson double end, No. 5 taper
No. 005 Natco Garvin duplex
Nos. 15½, 15½ D & 15½ F Foote Burt
Kingsbury two way

GEAR MACHINERY

10" Pratt & Whitney gear grinder
Nos. 3 & 12 Barber Colman hobbers
Nos. 8H, 12H, & 16HS Gould & Eberhardt
Nos. 1, 5A & 5AC Lees Bradner
No. 130 Cleveland Rigidhobber
12" Gleason straight path bevel
Nos. 7 & 61 Fellows gear shapers
Gleason bevel cutters, testers, etc.
24" Flather automatic spur
48" Brown & Sharpe auto. spur
Cimatool & Lipe chamfers

GRINDERS, CYLINDRICAL

4" x 12", 6" x 18", 10" x 18", 14" x 36", 16"x36" & 20"x48" Landis hydraulic
10"x24", 16"x36" & 16"x72" Landis mech.
6"x18" Norton hydr. semi-automatic
6"x18" & 10"x72" Norton hydraulic
10"x18", 10"x36" & 10"x50" Norton mech.
6"x18" Brown & Sharpe elec. hydr.
10"x18" Cincinnati hydraulic
12"x36" Bath universal
12"x30" No. 2 Brown & Sharpe univ.
No. 13 Brown & Sharpe univ.

GRINDERS, SURFACE

12", 16" & 24" Heald rotary
Nos. 10 & 16 Blanchard rotary
No. 16 A2 Blanchard 2 spindle
8" Pratt & Whitney rotary
12" Walker single stroke rotary
14"x60" Mattison hydraulic
12"x48" Thompson hydraulic
10"x24" Norton hydraulic
8"x22" No. 3 Abrasive
8"x22" No. 34 Abrasive vert.
14"x36" Pratt & Whitney vert.
6"x18", No. 2 Brown & Sharpe

GRINDERS, INTERNAL

No. 72A3 Heald plain
No. 72A3 Heald Sizematic
No. 72A3 Heald Elec. Indicator
No. 72A5 Heald plain
No. 75A Heald
Gronby precision bench
No. 104 Rivett
Majestic tool room
Nos. 32 & 42 Van Norman radius
Nos. 16F28, 16C16 & 24-36 Bryant

GRINDERS, MISCELLANEOUS

No. 2 Cincinnati centerless
No. 226 Gardner disc
20", No. 208 Besly disc
20" Gardner automatic disc
30" No. 228 Hanchett opposed disc
30", No. 86 Gardner vertical disc
2HP Standard pedestal
No. 51 Oliver drill
No. 6G & 10G Sellers drill
No. 1½ Cincinnati tool & cutter
No. 2 Norton tool & cutter
No. 3 Oakley tool & cutter
Cincinnati Face Mill cutter
Nos. 47 & 49 Excello carbide
No. 14D Hammond carbide
No. 1 Sellers univ. tool
Gisholt planer tool
Nos. 00 & 1 Osterholm oscillating
3 HP Mall flexible shaft
Model HRS Barber Colman hob
Nos. 33 & 35 Excello thread

LATHES

14"x6' Lodge & Shipley
14"x6' Mulliner
14"x8' Hendey
15"x6' Porter McLeod
18"x8' Lodge & Shipley
25"x48" ctrs. LeBlond late type
24"x96" ctrs. Monarch
36"x16' Bridgeford

LATHES, TURRET

Nos. 2, 3, 4 & 5 Warner & Swasey ram type
Nos. 1A & 3A Warner & Swasey saddle type
Nos. 3, 4 & 5 Gisholt ram type
Nos. 1L & 3AL Gisholt saddle type
No. 5 Foster
No. 5 Bardons & Oliver
1½", No. 601 Oster
Nos. 2G & 3 Morey
3"x36" & 4"x34" Jones & Lamson
24", 36" & 42" Bullard vertical

SHEET METAL TOOLS

Nos. 2A & 5½B High Speed riveters
Nos. 82A & 103 Grant riveters
No. 352 Toledo band roller
Yoder double seamer quickwork beader
No. 1 Pettingell bumping hammer

SHAPERS

16", 20" & 28" Gould & Eberhardt
20" & 24" Gemco universal
12" Whipp
6" Pratt & Whitney vertical
36' Rockford shaper planer

MILLERS

Nos. 2AS, 3B & 4B Milwaukee
No. 3 Cincinnati universal
No. 3 Van Norman duplex
Nos. 3 & 4 Cincinnati dial
Nos. 2H, 3H & 4H K & T vertical
Nos. 2, 2M, 3 & 4 Cint. vert.
No. 3V Van Norman vertical
Armor All Angle vertical & horiz.
No. 0-8 Cincinnati vertical
Nos. 1-18 & 2-24 Cincinnati automatic
Nos. 3-24, 4-36 & 5-48 Cincinnati hydromatic
Nos. 2 & 2RV Kent Owens hand
No. 2-20 Kent Owens hydraulic
No. M24 Kearney & Trecker
No. 1MM-60 U.S. Multimillers
No. 12 Brown & Sharpe
12" Cincinnati plain mfg.
18" Cin., plain & duplex
30" & 66" Newton rotary
30", 42" & 84" Ingersoll rotary
Type CT36 Lees Bradner thread
No. 3 Planomil thread
Type C Hall Planetary thread
No. 4 Lees Bradner univ. thread
4½"x12" Hanson Whitney thread
4" Pratt & Whitney spline
Rice Barton duplex spline
No. 12B Pratt & Whitney profiler
Model 1 MM-60 U. S. multimiller
24x24x20' Ingersoll planer type
51"x21"x20' Ingersoll planer type
No. 33 Sundstrand openside planer type, 2 vert. spdls., 90" feed
No. 33 Sundstrand, size 14x48

TAPPERS

No. 1V Natco Holetapper, 24 spdl.
No. 1 Bakewell
Nos. 2 & 2X Garvin
Natco multiple lead screw, one and 2 way

PLANERS

33"x33"x8' Cincinnati
48"x48"x12' Cincinnati
36" Rockford O.S. shaper planer

PRESSES

No. 15 Rouselle adj. table
12 ton Leffler horning
Nos. P1 & PAG4 Ferracute punching
Nos. 10, 73½ & 304 Bliss S.S.
Nos. 56 & 56½ Toledo S.S.
70 ton No. 4B23 Verson S.S.
100 ton HPM hydraulic
200 ton French Oil hydraulic
1000 ton No. 666 Toledo coining
Nos. 1½ & 1½C Bliss cam draw 35 ton Standard screw

Send for Complete Stock List

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HASCO'S NEW YEAR OFFERINGS

Check your requirements against our partial stock list

BORERS

ROCHESTER 3" Horiz. Bor. Mill, M.D.
BETTS 5" Horiz. Bor. Mill, Stat. Hd., M.D.
BULLARD 36" Vert. Bor. Mill, M.D. Side Hd.
PRATT & WHITNEY #1B Jig Borer, 1 HP M.D.
HEALD #47A Borematic, Motor Driven

DRILLS

AMERICAN 6'x19" Col. Radial Drill
LELAND GIFFORD 2 Spdl. Drills, Mtr. on Spdl.

GEAR MACHINERY

BARBER-COLMAN #3 Gear Hobber, M.D.
FELLOWS #7 Gear Shaper, M.D.
FELLOWS #76 Gear Shaper, M.D.
PRATT & WHITNEY Hyd. Gear Grinder, M.D.

GRINDERS

NORTON 6"x30" Type C Plain. Motor Driven
BROWN & SHARPE #10 Plain Grinder, M.D.
BROWN & SHARPE #11 Plain Grinder, M.D.
COVELL HANCHETT Centerless Grinder, M.D.
CINCINNATI 12"x36" Universal Grinder, M.D. (see photo #3)
HEALD #172 Intern. Grinder, Mtr. Dr.
HEALD #72A3 Inter. Grinder, M.D.
HEALD #72A5 Inter. Grinder, M.D.
BROWN & SHARPE #2 Auto. Surf. Grinders
ABRASIVE #3 Automatic Surface Grinders
ARTER #A3 Rotary Surface Grinder
BLANCHARD #16 Rotary Surface Grinder
INGERSOLL Cutter Grinder, M.D.
HAMMOND #10 OK Grinder, 1 HP, M.D.

LATHES

SEBASTIAN 12"x5' Grd. Hd.
PRATT & WHITNEY 13"x30" Grd. Hd. Lathe, M.D. (see photo #1)
REED PRENTICE 14"x6' Grd. Hd. M.D.
LEHMANN 16"x8' Eng. Lathe
LEBLOND 24"x10' Eng. Lathe
RYERSON 24"x10' Grd. Hd. Lathe, M.D.
LEBLOND 36"x32' Grd. Hd. Lathes, M.D.
PUTNAM 42"x18' Geared Hd. Lathe

MILLERS

DOW #1 Plain Miller
KEMPSMITH #2G Plain Miller, M.D.
VAN NORMAN #22L Plain Miller, M.D. (see photo #2)
CINCINNATI #3 Rect. Plain Miller, M.D.
CINCINNATI #4 Rect. Plain Miller
CINCINNATI #4 Vt. Miller, Sl. Hd.
GARVIN #1 Universal Miller, Vise

TURRET LATHES

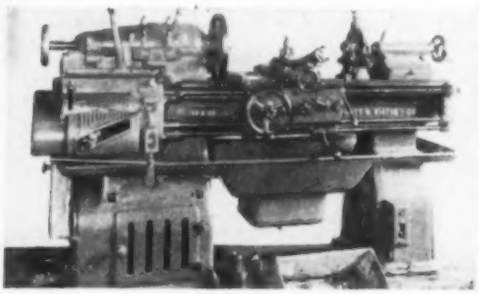
BARDON & OLIVER #2 Elect. Hd. 1" Cap.
WARNER & SWASEY #3A Grd. Hd. 4½" Cap.
WARNER & SWASEY #5 Grd. Hd. Univ. Selector Hd. Turret Lathe, M.D.
GISHOLT #4 Gd. Hd. Turret Lathe, M.D.

AUTOMATICS

CLEVELAND #AA-08 Sing. Spdl. 1-1/16"
GRIDLEY 1¼" F. Machine, 4 Spdl.
CONE 4⅜" Cap. Spdl. Auto. M.D.
CONE 8 Spindle 1⅝" Cap. Automatic

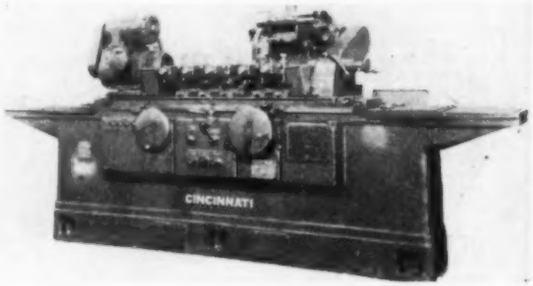
SHAPERS

GOULD & EBERHARDT 24" Crank, M.D.
CINCINNATI 24" Crank Shaper, M.D.
KELLY GEMCO 24" M.D. Crank Shaper



Actual photo #1

Actual photo #2



Actual photo #3

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BORING MILLS

3½" Cincinnati-Gilbert Floor Type
No. 350F Giddings & Lewis—5" Floor Type
4" Footburt Floor Type

DRILLS

#D5 Natco Multiple
Type G Hammond Radial
4' Cincinnati-Bickford Radial

GEAR MACHINERY

#13 Gleason Univ. Gear Tester
15" Gleason Quenching Press
15" Gleason Spiral Bevel Cutter Sharpener

GRINDERS

No. 72A3 Heald Plain Internal
No. 72A5 Heald Plain Internal
14"x48" Cincinnati Model EM Plain
12"x16"x36" Mattison High Powered Surface
14"x16"x60" Mattison High Powered Surface
24"x24"x120 Mattison High Powered Surface
12"x5" J & L Model TG125 Internal Thread
6"x15" J & L Model TG615 External Thread

NUT & BOLT MACHINERY

No. 2 Waterbury Farrel Automatic Nut Tappers
No. 44 Waterbury Farrell DSSD Headers
No. 0 Waterbury Farrel Screw Slotter

LATHES

16"x30" Springfield, Geared Head
Four—20"x48" LeBlond Geared Head
Three—27"x48" LeBlond, Geared Head
36" Lehman Hydratrol, Geared Head
48"x20' Centers Niles, Geared Head

PLAIN MILLING MACHINES

#000 Brown & Sharpe Automatic
No. M-18 Milwaukee Simplex
No. 1H-18" Milwaukee Mfg.
No. 2-18 Cincinnati Automatic
No. 2-24 Cincinnati Automatic
No. 2SP Van Norman
No. 3SP Van Norman
No. 22L Van Norman, Ram Type
No. 26 Van Norman, Ram Type
No. 36 Van Norman, Ram Type
No. 2MH Cincinnati
No. 4 Cincinnati High Power
No. 4 Cincinnati Dial Type, High Speed
No. 4 Cincinnati Dial Type, Medium Speed
No. 4K Milwaukee Plain
No. 5HM Milwaukee

UNIVERSAL MILLER

No. 3SU Van Norman

VERTICAL MILLERS

No. 2 Cincinnati, Dial Type, Medium Speed
No. 3 Cincinnati, Dial Type, Medium Speed
No. 3 Cincinnati, Dial Type, High Speed
No. 4 Cincinnati, Dial Type, High Speed
No. 2H Milwaukee
No. 2K Milwaukee
No. 3H Milwaukee
No. 4H Milwaukee
No. 5HM Milwaukee
No. 5 Reed Prentice

PLANER

36"x36"x10' Liberty Openside

TURRET LATHES

No. 1A Warner & Swasey, Geared Head
No. 2 Warner & Swasey, Geared Head
No. 2 Warner & Swasey, Electric Head
Fifteen—No. 3 Warner & Swasey Geared Head
No. 4A Warner & Swasey Geared Head
No. 3 Gisholt, Geared Head
No. 4 Gisholt, Geared Head
No. 5U Foster, Geared Head
No. 7A Jones & Lamson, Geared Head

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Here's an O'BRIEN Remedy!

OBSOLETE or balky machinery can really throw a monkey wrench into your production plans, upping your operating costs and killing your profits.

If a snag in production is giving you a king-size headache because your plant is inadequately equipped, your next move is to see O'BRIEN We have IN STOCK almost every kind of machine tool to help you increase production.

. . . And O'BRIEN prices won't put you in the barrel, either. . . . The following list of machine tools is by no means complete. If you don't see what you want, *Write—Wire—or Phone your requirements!*

LATE TYPE TOOLS FOR IMMEDIATE SHIPMENT—IN STOCK

UNIVERAL MILLING MACHINES

2—#2H Kearney & Trecker, new 1944
#2A Brown & Sharpe, motor in base, Timken Brg.
#3 Cincinnati, motorized
#4 Burke, floor model, M.D., Timken Brg., 1942

PLAIN & VERTICAL MILLERS

#2H Kearney & Trecker vertical, 1942
#3 Cincinnati, vertical, Hi-Power
#2B Brown & Sharpe, plain, dble. arm, motor in base
#3 Cincinnati, plain, slotting, rack & vert. attach.
#4 Cincinnati, plain, Hi-Power, Rect. arm
4—#4 Burke, plain, floor model, Timken Brg., 1942
3—#M26 Diamond, Plain, motor in base, never used
18" Cincinnati, duplex, M.D.
3—#000 Brown & Sharpe, production type, 1943

BORING MILLS

4" Ryder Wellman, table type, 54" x 30", 86" to outboard, 1942
#32 Lucas, 3¾",.table type, 9' to outboard
54" Gisholt, vertical, 2 hds., PRT, M.D.
42" King vertical, 2 hds., PRT, M.D.

GRINDERS

14"x60" Pratt & Whitney hydr. vert. surface, 1942
14—#2 Kent, 6"x19", surface, 1943
#11 Blanchard, 16" rotary, 1941
#13 Brown & Sharpe Univ. & Tool, 1943
6" x 30", 10" x 36" Norton "C", hydr., plain, latest type

TURRET LATHES, AUTOMATICS

#3A Warner & Swasey, Timken Brg., covered ways, bar feed, collets
12—#6W Acme, universal, air chucks late type, low priced
#4 Warner & Swasey universal, Timken Brg., Mtr. in base, bar
#2 Bardons & Oliver, elec. head, collet chuck, latest
2—1" Greenlee, 6 spindle, auto., latest, like new
2—#2G Brown & Sharpe, auto., high speed, late type

GEARED HEAD LATHES

60" x 26½' c/c N-B-P motor drive
60" x 15' c/c N-B-P, taper, PRT, 1943
36" x 14' American, high duty
3—24" x 11' G-K, 16 speeds, taper, pan
20" x 10' American, 8 speeds, taper
18" x 10' Sebastian, 8 speeds, new 1947
18"/27" x 8' Nebel, gap, new 1947
18" x 10' Monarch, pan, taper, mtr. in base
15" x 6' Carroll-Jam., Timken Brg., taper, collets, latest
12"/14½" x 30" c/c Monarch "C" taper, collets, etc., 1942
12" x 5' Sebastian, taper, new 1947

PRESSES

#58 Niagara, 100 ton, 6" stroke, M.D.
#4, 5, 6 Federal, O.B.I. M.D.
3—#A1½ Niagara, 10 ton, M.D., Latest
#01W V & O, 10 ton, O.B.I., M.D. Late
30 ton Watson Stillman hydr. pump

MISCELLANEOUS

ML 16 DoAll Contour Saw, Late
7" Peerless Hydracut Saw, 1942
50 KVA Eisler Spot Welder, M.D. arm
2", 4" Oster Pipe Machines, M.D.
2½" Acme-Landis bolt threader
¾" Pawtucket bolt forger
#U31 Yates American wood borer
#40 Cincinnati 10' press brake, 12 ga.
Baker #6 M.T. Drill, M.D., late

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POWER PRESSES

TOGGLE DRAW PRESSES

BLISS Nos. 1½, 1½B, 3½A, 3½B, 3½C, 4 & 16 S
TOLEDO 164¼ (All with friction clutch)

OPEN BACK INCLINABLE

BLISS Nos. 18, 19, 20, 21, 22, 23 and 21B
FERRACUTE C-5 (Steel Frame)
STANDARD Nos. 5S, 8S, & 10S
V & O Nos. 0, 0½S, 1, 2, 4, 101, 103 & 104 (Equipped with Dial or Roll Feeds)
ZEH & HAHNEMANN Nos. 36-2, 36-4, 36-5 (M.D.)

GAP FRAME AND DEEP THROAT

BLISS Nos. 1, 2, 3, 4, & 5 End Wheel
BLISS No. 31 Flywheel M.D.
BLISS Nos. 58 and 61 Reducing Presses
BLISS No. 2-24" throat, Geared
FEDERAL No. 2 M.D.
FERRACUTE Nos. P-1, P-2, P-3, P-4 & PG-5 Geared
MANVILLE No. 30 with Roll-feed or Dial Feed
MICHIGAN 30" & 36" Deep Throat End Wheel
NIAGARA No. 37 Flywheel, M.D.
TOLEDO Nos. 15 & 17 Deep Throat & 77
V & O No. 00 High Speed, M.D., ¾" Stroke

DOUBLE ACTION

ADRIANCE Nos. 44 & 46 with Roll or Strip Feeds
ADRIANCE 16 DIE BOTTLE CROWN PRESS
BAIRD No. B Tandem with Roll Feed
BLISS No. 1, 1½B & 3 with Roll Feeds
BLISS No. 106—6 Plunger 90 Ton
V & O Nos. 10 & 11 with Roll Feeds
WATERBURY-FARREL No. 1 & 4 with Roll Feeds—

STRAIGHT SIDE

BAIRD Nos. 2, 3 & 4 with Roll Feeds
BLISS Nos. 37½, 52, 75½, 76½, 77½, 78½ Geared
BLISS Nos. 303½, 304, 305, & 307½ M.D.
FERACUTE Nos. E3 & E4 (Perforating)
TOLEDO No. 59¼ (Forging Press)

PRACTICALLY NEW BLISS No. 89A TWIN-GEAR DOUBLE BACK-GEARED, M.D., FRICTION CLUTCH (NEW 1941)

DOUBLE CRANK

ADRIANCE & WATERBURY PERFORATING with Roll Feeds
BLISS Nos. 102, 21-B, 21-D, & 103S
NIAGARA Nos. 66-F (18"x48"), 67-C (30"x48"), Grd.
TOLEDO Nos. 92C (30"x48"), 93C (36"x48"), Grd. MD
WEST 48"x24" Geared
WELLS Nos. 6 & 10 GANG PUNCHING PRESSES

FERRACUTE ROTOR BLANKERS

KNUCKLE JOINT & PERCUSSION

BLISS 50 Ton, 600 Ton, 1000 Ton
FERRACUTE EG 51, EG 52
WATERBURY-FARREL 60 & 320 Ton
ZEH & HAHNEMANN 60 Ton GAP TYPE
ZEH & HAHNEMANN 50 & 150 Ton Percussion

WILLIAMS & WHITE No. 29U BULLDOZER M.D.

HORNING & WIRING

ARDIANCE No. 24
BLISS Nos. 16, 39, 40 & 4A
BLISS No. 2W with Friction Clutch
NIAGARA No. 14 with Table, M.D.

WATERBURY-FARREL PRODUCTION

EYELET PRESSES Nos. 106 and 158
SIX PLUNGER TRANSFER, 90 Ton
CUT & CARRY No. 2½ with Roll Feeds (2)
DIAL FEED PRESSES 5 to 40 Ton Ratings
REDRAW PRESSES STROKES 4" to 20"
DOUBLE ACTION PRESSES WITH ROLL FEEDS

HENRY & WRIGHT 25 TON & 50 TON DIEING MACHINES EQUIPPED WITH DOUBLE ROLL FEEDS & SCRAP CUTTER

ELECTRIC WELDERS

PRACTICALLY NEW FEDERAL 700 KVA PROJECTION TYPE SPOT WELDER, AIR OPERATED, ELECTRONIC TIMER

AMS, TAYLOR-WINFIELD, FEDERAL, THOMPSON FOOT & POWER OPERATED 5 to 150 KVA
THOMPSON-GIBB SEAM WELDERS
THOMPSON-GIBB & FEDERAL BUTT WELDERS
MICRO PORTABLE BUTT WELDERS

WIRE WORKING

BAIRD, NILSON, & MANVILLE Nos. 1, 2, 3, 320 & 4 Four Slide Wire Formers
U. S. TOOL Nos. 33, & 44 Multi-Slides
SLEEPER & HARTLEY Nos. 1½, 2, 2½, 3, 4 & 5 Universal Spring Coilers
SLEEPER & HARTLEY SPRING LOOPERS & SPRING SETTING MACHINES
WELLS BED SPRING MACHINERY
LEWIS, SHUSTER & WELLS Automatic Wire Straightening & Cutting Machines, all sizes 1/32" to ⅞"
LEWIS Nos. 3F and 4F Travel-Cut Straighteners
BAIRD Automatic Chain Machines
NATIONAL Automatic Wire Nail Machines
AUTOMATIC BARBED WIRE MACHINE

VAUGHN #12 SINGLE & DOUBLE DECK MOTOBLOCS

WATERBURY-FARREL #0 Sleeve Type Wire Drawing Machine for Aluminum and Copper Rod
WATERBURY-FARREL #3 and 4 Bull Blocks
WATERBURY-FARREL #1 Step Cone & #1 Straight Roll Wire Drawing Machines for fine wire (some equipped with blocks & some with spooling attach.)
STANDARD TORRINGTON & LANGLIER Wire & Tube Swagers in all sizes
STANDARD & WATERBURY Wire Flattening Rolling Mills with Take-ups

STANDARD, #8I TURKS HEAD FOR ROLLING FLAT & SPECIAL SHAPE WIRE M.D.

MACHINERY FOR THE MASS PRODUCTION OF WIRE SPECIALTIES SUCH AS WIRE STAPLES, HAIR & BOB PINS, PAPER CLIPS, STRAIGHT & SAFETY PINS, NAILS, WIRE BASKETS, ETC.

ROLLING MILLS

McWILLIAM 3"x5" & 6"x10"
WATERBURY-FARREL & UNITED ENGINEERING 6"x14" & 8"x10"
BLAKE & JOHNSON 12"x24"
WATERBURY 12"x12"—2 High Mill Stand

BOLT, SCREW & NUT EQUIPMENT

WATERBURY & MANVILLE Nos. 0, 1, 2, 3 & 4 Solid & Open Die Cold Headers
WATERBURY-FARREL Nos. 10, 20, 30, 40 & 50 Thread Rollers
WATERBURY-FARREL & MANVILLE ROD HEADERS ¼" and ⅜" cap.
WATERBURY-FARREL & MANVILLE Nos. 1 & 2 Automatic Screw Slotters
WATERBURY-FARREL & MANVILLE Nos. 1 & 2 Automatic Nut Blanking Machines
MANVILLE Automatic Wood Screw Machinery
NATIONAL ¼", ⅜", ½", ⅞" Bent Shank Tappers

SHEET METAL MACHINERY

POWER SHEARS

NIAGARA & PEXTO 30", 36", 52", 96", 132" up to ¼" Cap.
NIAGARA & CANTON 14 Gage x 11', M.D.
PELS Heavy Duty Beam & Channel Shear Cap. 12" I-beam
SONNTAG Combination Angle Bar & Flat Shear (5"x 5"x½")
QUICKWORK & PETTINGALL Deep Throat Shears
NIAGARA & BLISS Ring & Circle Shears
CAMPBELL Nos. 1, 1B, & 2 Nibblers

LITTEL STRIP STRAIGHTENER & AUTO. CUT-OFF CAP. 8"x10 ga. M.D.

SLITTERS

ADRIANCE, BLISS, CAMERON Gang Slitters
WATERBURY-FARREL Nos. 0 & 1 with Rewind
TORRINGTON 48" Slitter Cap. ⅜", M.D.
WATERBURY, PEXTO, BLISS Rotary Slitters, cap. 1/16 to ½" Threat Depths up to 30"

ROLL FORMERS

NEW RAFTER 12 STAND CAPACITY UP TO 14" WIDE, M.D.

YODER Flying Shear Cut-off
RAFTER 5 Head Duplex, DOOR BUCKS
YODER 10 Stand 18" Wide
Number of Misc. Types 4, 5, 8 heads, with cutoffs

POWER BRAKES

VERSON 54"x14 gage, M.D.
CINCINNATI 72" & 96" x 12 Gage, M.D.
KEENE 132" x 14 Gage (Corrugating)

CAN MACHINERY

CALLAHAN No. 127 ¾S Square Seamers
BLISS & AMS Round Double Seamers
NIAGARA No. 9 Round Seamer for Drums
BLISS & McDONALD Strip Feed Presses
BLISS & NIAGARA Power Beaders & Flangers
BLISS & V&O Thread Rollers and Trimmers

MISCELLANEOUS

AMERICAN HORIZONTAL BROACH 36" x 10 Ton, new 1943
CAMPBELL No. 401 Cutamatic, M.D., new in 1942
BODINE & RICKERT-SHAFER Semi-auto. and Full Auto. Tapping and Threading Machines
GORTON 3U & 3Z Pantograph Engravers
KELLER (Pratt & Whitney) E-2 Duplicator
Riveting Machines, Spinners, Hammers and Stakers
Production Machine Co. Centerless Tube Polishers
Pines Profiling and Chamfering Machines

COLLAPSIBLE TUBE EXTRUDING PRESSES

MACHINE TOOLS

BORING MILLS

CLEVELAND 2½" Bar Table Type
BARRETT 3¼" Bar Table Type
LUCAS #43 Precision—5" Bar Table Type
COLBURN 48" Vertical 2 Heads
BICKFORD 50" Vertical 2 Heads

DRILLS

BAUSCH 12 Spindle Multiple capacity up to 1½"
CANEDY OTTO 4' Radial, M.D.
CINN-BICKFORD 5' Radial, M.D.
FOSDICK 3½' Radial, M.D.

PLANERS

CINCINNATI 36"x36"x16' Box Table 3 Heads, M.D.
WOODWARD & POWELL 42"x42"x36' 4 Heads
GRAY 42"x24"x8' Widened Pattern 2 Heads
SELLERS 36"x36"x9' 4 Heads
POWELL 36"x36"x8' Heavy Duty

TURRET LATHES AND AUTOMATICS

WARNER & SWASEY Nos. 2, 3A, 4 & 8 Late Type, Fully Equipped
JONES & LAMSON 1½" Bar Cap. Universal, Practically new
GRIDLEY 1¼" Four Spindle Automatics
NEW BRITAIN ¾" & 1" Six Spindle Automatics
BROWN & SHARPE #2G Automatics (New 1941)

GRINDERS

BROWN & SHARPE & REID No. 2 SURFACE
HEALD No. 81 Sizematic, Chucking (New in 1942)
HEALD No. 22—12" Rotary, (new in 1943)
NORTON 10"x36" Hydraulic Table Traverse
PRATT & WHITNEY 14" Vertical Cup Wheel

SHAPERS

GOULD & EBERHARDT 16", 20" & 24" M.D.
SMITH & MILLS 24" Gear Box, M.D.
CINCINNATI 36" Planer Type with Grind. Attach.

LATHES

MONARCH Model EE, Full equipment inc. Power Feed Turret Attachment, Collet Attach., Taper Attach.
AMERICAN 27"x10' T.A., M.D.
HENDEY 14"x6', 16"x6' Q.C.G., T.A.
LeBLOND 16"x12' Q.C.G., M.D.
DRAPER 27"x16' Geared Face-plate Drive
McCABE 2 Spindle 24"—46"x14'
WALCOTT 26"x12' Q.C.G., M.D.
LODGE & SHIPLEY 24"x14' Q.C.G., 12 Speed, M.D.

MILLERS

CINCINNATI No. 2 High-Speed Dial Type Plain (New 1942)
CINCINNATI Nos. 2, 3 & 4 Plain & Vertical M.D.
KEMPSMITH No. 3 Universal, M.D.

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Two BRAND NEW machines:
One—No. 81 HEALD Internal Size-Matic Grinder, complete with standard equipment, Red Head Grinding Spindle, many extra features. NEVER USED AT ALL.
One — No. 11 RD WARNER & SWASEY Two-spindle Radial Tapping Machine, serial over 800000, with complete standard equipment. NEVER USED AT ALL.
Both machines are offered at less than 40% of today's price—and they are NEW!

DRILLING MACHINE

One—model 4BL NATCO Multiple Spindle Drill, with ADJUSTABLE spindles. Head bored for 36 spindles, 1" upper joints, for holes up to 1/2" in aluminum or 1/4" in cast iron. With hydraulic loading fixture. Machine like new. 26" dia. round head.

MILLING MACHINES

One—3-24 CINCINNATI Hydromatic Duplex Milling Machine, with auto. spindle stop.
One—No. 5-48 CINCINNATI Hydromatic Plain Milling Machine, with auto. spindle stop and variable feed mechanism. New in 1943.
One—4-48 CINCINNATI Plain Hydromatic Milling machine. New in 1945.
One—No. 2 CINCINNATI Dial Type Vertical Milling Machine, with complete standard equipment. New in 1942.
One—No. 2K KEARNEY & TRECKER Vertical Milling Machine, with power feed also to head, with complete standard equipment.
One—3H KEARNEY & TRECKER Vertical Milling Machine. Latest type, new in 1942.
One—No. 0-8 CINCINNATI Vertical Miller, new in 1942. In perfect condition.
One—No. 2M CINCINNATI Universal Miller, with Univ. Dividing Head and Vertical Drilling Head, motor drive, all geared, new about 1930.
One—No. 1218 KEARNEY & TRECKER DUPLEX Miller, new in 1941, with 18" table travel.

VERTICAL SHAPER

One—6" PRATT & WHITNEY Vertical Shaper, new in 1943, like new.

GRINDERS

Eight—HEALD No. 72-A-5 Universal Internal Grinders, with cross sliding headstock. New in 1944. In very fine cond.
One—No. 72-A-3 HEALD Gagematic Internal Grinder, late type.
Two—No. 70A HEALD Internal Tool Room Grinders, complete with motors and controls. Power feeds. Late style machines.
One—No. 55 HEALD Cylinder Grinder, new in 1942, mtr. drive.
One—No. 2 CINCINNATI Centerless Grinder, with FILMATIC spindle bearings. Latest model.
One 14"x48" CINCINNATI Universal Grinder, new 1943. With all attachments. Hydraulic table feeds. Motor drive.
Several No. 35 and 35-L EXCELLO Universal Thread Grinders, new in 1942.
One—FELLOWS model 4S Helical Cutter Sharpener, latest model, like new.
One—6"x18" NORTON Hydraulic Surface Grinder, new in 1942, with permanent magnetic chuck.
Model A-3-16" ARTER Rotary Surface Grinder, with 17" dia. magnetic chuck, new in 1943.
One—No. 10 BLANCHARD Rotary Surface Grinder, 16" magnetic chuck. Very fine condition.
No. 81 HEALD SIZEMATIC Internal Grinder, brand new. New in 1945.
No. 81 HEALD SIZEMATIC CENTERLESS Grinder, latest type, new in 1942.
Two—Bryant No. 16-RS-16 Internal Grinders, like new, with Skinner chucks, equipped for simultaneous grinding of holes with various diameters. Hole through spindle, 6 1/8".

PLANER

One—72x56x32' CINCINNATI Double Housing Planer, box table. Two rail heads, two side heads. Belted motor drive, with AC motor.

LATHES

One—20"x48" centers LeBLOND HD. Lathe, new 1942.
27"x13' centers LERMANN HYDRATROL Lathe, new 1942, in excellent condition. Swings 30 1/2".
27"x11' centers AMERICAN Heavy Duty Lathe, Taper Attachment, extras, swings 30 1/2", bed length 16'. New in 1929.

TURRET LATHES

One—No. 3 BARDONS & OLIVER Universal Ram Type Turret Lathe, latest style.
One—No. 3 WARNER & SWASEY Univ. Ram Type Turret Lathe, latest style.
One—No. 3 GISHOLT Universal Ram Type Turret Lathe, new in 1943. In very fine condition.
One—No. 3L GISHOLT Universal Saddle type Turret Lathe, new in 1943.

GEAR MACHINERY

One—model 65-A-3 FELLOWS Gear shaper, for external and internal spur and helical gears up to 18" dia. New in 1944. Excellent condition.
One—model 61 FELLOWS Gear Shaper, for external and internal spur gears. Max. capacity 36". New in 1944.

BROACHING MACHINE

One—model H-30-66" AMERICAN Horizontal Hydraulic Broach, 30 tons capacity, 66" stroke. New in 1941.

BORING MACHINE

One—No. 48A HEALD Single End Precision Boring Machine (BORE-MATIC), with standard longitudinal and cross hydraulic movements. New in 1942.

This is only a small part of our stock. Please send us your inquiries for needed equipment.

LAURENS BROS., INC.

2780 HIGHLAND AVENUE

CINCINNATI 12, OHIO

MDNA MEMBER

Phone: REdwood 3500

HIGH GRADE TOOLS FOR EVERY TYPE OF JOB

Every Item a "Special"— Every Item Available Immediately

GRINDERS

GRINDERS CENTERLESS

No. 2 Cincinnati M.D. Nearly new late type.
No. 3 Cincinnati M. D. 1943 practically new.
No. 2 Cincinnati M.D. Older types very good.
No. 3 Cincinnati M.D. Older type very good.

GRINDERS TOOL AND CUTTER

No. 2 Cincinnati M.D. Latest Type.
No. 1½ Cincinnati Universal Full equip.
No. 3 Oakley Universal.
No. 4 T Sellers Tool grinder.
No. 6 Sellers Tool Grinder.

GRINDERS SURFACE

No. 1 Wilmart Morman with 6"x13" Chuck.
16" Heald Rotary Surface Grinder.
No. 16 Blanchard Vertical M.D. 36" Chuck.
No. 16 Blanchard Vertical M.D. 30" Chuck.
No. 16 Blanchard Vertical M.D. 26" Chuck.
No. 18 Blanchard Vertical M.D. 30" Chuck late type nearly new.
14" Pratt & Whitney Vertical Ball bearing M.D.
Type A Production Co. Grinder.
A3-16" Arter Rotary, late type.
16"x72" G&L with Chuck, late type.

GRINDERS INTERNAL

16 C Bryant Deep Hole Grinder M.D. Latest Type.
No. 70-A Heald M.D.
Majestic internal grinder M.D.
No. 72-a-3 Heald Plain M.D.
No. 73-a-3 Heald Sizematic M.D.
No. 70 Heald Belt Drive.

GRINDERS PLAIN CYLINDRICAL

No. 1 Morse 5"x21" Belt Drive.
No. 2 Landis Universal, 12"x36" belt
14"x96" Norton Plain, M.D.
16"x96" Landis Universal, late type.
10"x24" Landis Universal, late type.
No. Type B. A. Norton 10"x24" M.D.
20"x220" Landis Grinder M.D.
20"x240" Norton Grinder M.D.

MILLING MACHINES

PLAIN

No. 1H Milwaukee, late type.
No. 2B Mrown & Sharpe M.D. with motor.
No. 2B Milwaukee M.D. with motor D.O.
No 2H Milwaukee D.O.A. Late type.
No. 2 Cincinnati High Powered motor in Base.
No. 3 Cincinnati Single P.D.
No. 3 Cincinnati Cone.
No. 3B Milwaukee Single P.D. D.O.
No. 3B Heavy Brown & Sharpe Arr. M.D.
No. 34 Ohio Plane Cone.
No. 4 Cincinnati Motorized.
No. 4 Cincinnati Dial type High Speed M.D.

MILLING MACH.—Plain *(Cont.)*

No. 4 Cincinnati High Power M.D.
No. 4H Milwaukee M.D. in Base.
No. 5 Cincinnati H.P. M.D. Ret. Overarm.
No. 5B Brown & Sharpe Single P.D.
No. 12 Van Norman, Motor Drive.
No. 21 Brown & Sharpe M.D. in Base.

MILLING MACHINES

VERTICAL

No. 40H Index Vertical.
No. 2 Brown & Sharpe M.D.
No. 2M Cincinnati M.D.
No. 2 Cincinnati Dial Type.
No. 2K Milwaukee late type.
No. 3 Cincinnati High Power M.D. in Base.
No. 3 Cincinnati Dial Type latest M.D.
No. 3K Milwaukee late type.
No. 4 Cincinnati High Power Single P.D.
No. 4H Milwaukee, late type.
No. 6 Becker Arranged for motor drive.

MILLING MACHINES

UNIVERSAL

No. 1D Brown & Sharpe, Belt Drive.
No. 2 Cincinnati, Belt Drive.
No. 2B Milwaukee Double Overarm, M.D.
No. 3 Cleveland Univ. S.P.D.
No. 3 Cincinnati Dial Type, LATE TYPE.
No. 3-A Brown & Sharpe M.D.
No. 4-A Brown & Sharpe Single P.D.

MILLING MACHINES

MANUFACTURING TYPES

No. Type P. Ohio Production M.D. Latest Type.
24" Cincinnati Automatic Single P.D.
No. 3-24 Cincinnati Hydromatic Plain.
No. 4-36 Cincinnati Hydromatic Plain.
No. 118 Van Norman Bed Type Prod.
28" Cincinnati Semi Automatic.
No. 45-60 Cincinnati Hydraulic Duplex.

LATHES

16"x8' Sebastian Geared Head.
17"x12' LeBlond Geared Head.
18"x10' Boye & Emmes Geared Head.
21"x8' LeBlond Cone.
21"x16' LeBlond Q.C. B.D.
22"x18' Walcott Q.C. Motorized.
24"x10' Boye Emmes Cone.
24"x10' American Geared Head S.P.D.
24"x18' American Geared Head.
25"x10' LeBlond Geared Head M.D.
24"x10' American Geared Head M.D. Taper attachment.
24"x24' Lodge & Shipley B.D.
24"x26' Sidney Monotrol, M.D.
26"x10' Walcot Cone.
30"x12' LeBlond Cone Triple Geared Hexagon Turret
30"x18' LeBlond Q.C. Motorized.
24"x14' Springfield, Geared Head.
42"x18' American Grd. Head 16 speeds.
36"x30' Lodge & Shipley Selective Geared Head Two Carriages.
36"x32' American Geared Head Two Carriages. Taper.
36"x27' American Geared Head Two Carriages. Taper.

LATHES TURRET

B. G. Simmons Microspeed Motor in base latest type.

LATHES TURRET *(Cont.)*

2¼"x24" Jones & Lamson M.D.
3x36" Jones & Lamson M.D.
3½"x32" Jones & Lamson Motor Drive late type.
No. 1 Acme Universal Fixed Center.
No. 3AL Gisholt Universal, M.D.
No. 1B Foster Universal, M.D.
No. 3A Warner & Swasey S.P.D.
3L Gisholt Saddle type M.D. Late Type.
No. 4 Millholland and Bar work 1⅝" capt.
No. 4 Gisholt Universal, late type.
No. 4 W&S Universal, late type.
No. 4A Warner & Swasey Universal 12" Spindle hole M.D. Latest type.
No. 5 Bardon & Oliver, bar feed, late type.
No. 6 Warner & Swasey Cone.
21" Gisholt Cone.
2L Gisholt Universal Saddle Type M.D. Latest Type.

LATHES ENGINE

14"x6' Bradford Cone Motor Drive.
14"x6' Hendy Geared Head M.D.
14"x6' Mamilton Cone.
14"x6' Mulliner Cone.
14"x6' Monarch Cone.
14"x6' Hendy Cone, Taper—Draw in attachment Tool Room.
16"x6' C & J Geared Head, NEW
16"x6' LeBlond Geared Head, Taper Draw in attachment.
16"x8' C & J Geared Head, NEW
16"x8' Hendy Cone.
16"x8' L & S Geared Head, 12 speed.
18"x18' Sidney Monotrol, M.D.
18"x6' Reed Cone.
18"x8' Bradford Cone.
18"x8' Lodge & Shipley Cone.
20"x14' Boye & Emmes Q.C. B. D.
20"x12' American Geared Head, 12 speeds.
20"x15' American Geared Head, 12 speeds.
24"x24' L & S Q.C. 3 stop Cone.

LATE TYPE MACHINES— Built in 1943, 1944, & 1945

24"x10' American Lathe.
No. 2H Milwaukee Vertical Miller.
No. 4 Cincinnati Dial Type Vertical.
No. 3B-12" Edlund Drill.
No. 2 Avey 3 spindle Drill.
No. 204¼ Barnes 2 spdle. Pwr. Feeds.
10"x24" Landis Univ. Grinder.
16"x96" Landis Univ. Grinder.
16"x72" G&L Surface Grinder.
A3-16" Arter Rotary Grinder.

SPECIALS

No. 9A Marvel-Hack Saw, Auto. Feed Late Type.
No. 18-36" Blanchard Rotary Surface Grinder.
No. 3 Cincinnati Dial Type Universal Miller, Late Type.
36" Bullard "New Era" Vertical Turret Lathe.

CINCINNATI MACHINERY CO., INC.

217 EAST SECOND STREET — **CINCINNATI 2, OHIO**

LATHES

8"x15" Sundstrand, Model D
10"x22" Sundstrand, Model AA
12"x18" Lipe Carbo
15"x5' Sebastian
14"x6' Hendey
18"x6' American
20"x10' Lodge & Shipley
20"x25" Fay Automatics (1942)
22"x48" Centers Monarch (1942)
36"x30' Lodge & Shipley
36"-48"x16' Lehman Hydrotrol
50"x17' cc LeBlond (1942)

MILLING MACHINES

No. 2H Milwaukee Vert. (1942)
No. 2 Cincinnati Vert. (1942)
No. 2M Cincinnati Vert. (1941)
No. 3 Standard Milwaukee Vert.
No. 3 Cincinnati Vert. High Power
No. 3K Milwaukee Vertical (1942)
24" Cincinnati Production
No. 1-18 Cinn. Mig.
No. 2-18 Cinn. Rise & Fall (1941)
No. 4-48 Cinn. Hyd. Tracer (1942)
No. 5-48 Cinn. Hyd. (1942)
No. 45-48 Cinn. Plain Hydromatic (1942)
No. 45-48 Cinn. Hyd. Duplex Tracer (1943)
No. 45-48 Cinn. Hyd. Plain Tracer (1942)
No. 56-90 Cinn. Hyd. (1943)
No. 2 Hanson-Whitney Thread
4"x8" Hanson-Whitney Univ. Thrd. Miller
4½"x12" Pratt & Whitney, Model C
6"x20" Pratt & Whitney, Model C
8"x36" Lees-Bradner Thread Miller
12"x54" Lees-Bradner—Model HT (1943)
4" Taylor & Fenn Spline, M.D.
Ingersoll Traveling Column Miller
24"x24"x12' Ingersoll Adj. Rail
54"x36"x10' Ingersoll Adjustable Rail
60"x48"x12' Ingersoll Adjustable Rail

REMANUFACTURED MACHINE TOOLS
-(ORIGINATED BY US)-
Reg. U.S. Patent Office

DRILLS

No. 121 Baker
No. 217 Baker—(1943)
No. D-8 Colburn No. 8 M. T.
No. 3MS—24"—1 Spdl. L.G.
No. 2LMS—20"—2 Spdl. L.G.
No. 2 LMS—26"—2 Spdl. L-G (1945)
No. 2 LMS—26"—4 Spdl. L-G
24"—4 Spdl. Demco
No. 2—8 Spdl. Leland-Gifford
7'-15" Col. American Full Universal
7'-15" Col. Carlton, Motor on Arm

VERT. BOR. MILLS

34" King
42" Bullard New Era
52" King
72" Cincinnati
72" Niles Extra Heavy
84" Betts

HOR. BOR. MILLS

No. 31—3" Bar Lucas
No. 3A—3" Bar Universal
Rockford, 3⅛" bar
No. 360-F Giddings & Lewis (1942)
No. 560-F Giddings & Lewis (1942)

GEAR MACHINES

No. 4—48" Brown & Sharpe
No. 7 Fellows Gear Shaper
11" Gleason Bevel Gear Cutter

MISCELLANEOUS

Model H-7 Micromatic Vert. Honer
2500 Ton Lake Erie Hydraulic Press
No. 22-C Racine Shear Cut Hack Saw

TURRET LATHES

No. 2 B. & S. Screw Machine, Wire Feed
No. 601 Oster Rapiduction
No. 3 Jones & Lamson (1942)
No. 4 Gisholt (1942)
No. 5 Warner & Swaseys (1942)
No. 5 Bardons & Olivers (1942)
No. 5 Foster, A.C. & Bar Feed (1942)
No. 2-A Warner & Swasey
No. 6R Denver, A.C. & Bar feed
No. 1-H Libby, 6¼" Hole in Spindle (1937)
18" Libby, 3½" hole in spindle

GRINDERS

4"x12" Landis, Model H
6"x18" Norton Type C Plain (1943)
6"x30" Norton Type C Plain (1943)
10"x36" Norton Type C Plain (1943)
16"x72" Norton Type C Plain (1944)
Norton Motor Driven Plain Grinders
6"x18" ——— to ——— 24"x240"

10"x24" Landis Type C Universal
12'x36" Landis Type LCH Universal (1945)

No. 34 Abrasive Surface (1943)
No. 22—12" Heald Rotary Surface
No. 25A—16" Heald Rotary Surface (1942)

72A-3 Heald Internal Grinder
10"x72" Colonial Broach Grinder
No. 5—18" Besly Disc Gdr.

HILL-CLARKE MACHINERY CO.

651 WASHINGTON BLVD. CHICAGO 6, ILL.

SURPLUS EQUIPMENT

AVAILABLE FOR IMMEDIATE DELIVERY

#3 Waterbury-Farrel punch press, capacity 20 ton stroke 2½", ram adjustment, 60 strokes per minute, shut height, 6½", bed size F to B 10½", R to L 14½" $475.00

#6600 Waterbury-Farrel punch press, cap. 56 ton, vertical back geared, open back, straight sided stroke 6", 60 strokes per min., 20" shut height, distance between uprights —46", bed size 10"x45", 5 HP motor, push button switches, V drive $1750.00

#PG-6 Ferracute Punch Press geared 1¾" stroke, bed area R to L by F to B 34¾x23. Opening in bed R to L by F to B 16x14. Slide adjustment. Height overall 103". $2750.00

Van Norman Horizontal Milling Machine with 2 direct drives. Milling heads motorized, serial number 11065 ..... $642.00

#5 Waterbury-Farrel blanking & cupping press $380.00

#35P Toledo punch press, gap type, flywheel 48"x7", bed size 27"x18", stroke 1¾", 15" from bed to bottom of rain ways, motor rack, not motorized. Pitman strap and eccentric just rebuilt $1500.00

Model RA-6, six-spindle Acme-Gridley automatic, 9/16" bar cap., including tooling and equipment, serial #22377A, practically new $3950.00

Spot welder, 75 KVA gun type with air control, model S1DS5, serial #2801, Progressive $650.00

Hayes Electric Heat Treat furnace type HG64, Serial No. 3496 with controls $350.00

#5 Long & Allstatter Gate Shear, shear blades 42"x3½"x⅞" shearing capacity ½" thick copper $950.00

BILLARD MACHINE & TOOL CO.

PHONE 44 MANSFIELD, PA.

PRESSES

STRAIGHT SIDE—60 ton, 5" stroke, 48x24 bed, late model Waterbury Farrell (15).

90 ton, 8" stroke, 50x18 bed, Bliss (3), 42'
200 ton, 32" stroke, 27x27 bed, Bliss, 43'
#56 Toledo, 4" stroke, 21x21 bed, 15½" shut height.
35 ton, 4, 5, 6" stroke, latest type, pract. new, w/all accessories, Bliss $850.00 ea.
70-85 ton, 4" stroke, 21x27 bed, 110 strokes per min., Bliss, latest type.
90-125 ton, 4½" or 5½" stroke, 60, 80, 110 (optional) strokes per min., latest type.
INCLINABLE—#21 ½A Bliss, brand new, w/ cushions, 6" stroke, 18" shut height (3).
55 ton Walsh, brand new, 3½" stroke, 9" shut height.
15 ton, new $363.00; 4½ ton, new $165.00.
35 ton, Toledo Herning, 2" stroke.

AUTOMATICS

1⅝" Acme Gridley, 6 spdl. latest type (2).
2¼" Cone, 6 spdl., latest type (4).
16" 8 spdl. Bulard Multaumatics, pract. new, $9000.00 ea. (5).

Horiz. Boring Mills Table Type, late design.
5" Sellers, 84x48 tbl., 72" vert. trav. spdl.
5" Giddings & Lewis, 84x48 tbl, 60" vert. trav.

BRAKE

10'x⅛" Henderson Power Press Brake, 30 HP motors and controls. Just taken out of operation.

SPOT WELDERS & BUTT WELDERS

Prompt delivery, 5 to 300 KVA, Brand new, guaranteed.

PAUL'S MACHINERY COMPANY
6111 Vermont Avenue
Detroit 8, Michigan
TYLER 7-6300

Bor. Mill Hor. 3" G & L, M.D.
Boring Mills, 24"-36"-42"-52"-72"-96"
Drills, Radial 3'-4'-5'-6' Cin.-Bick.
Lathe, Turret 2-A W. & S., S.P.D.
Millers, Plain No. 5 K & T. No. 4 Cin.
Millers, Vertical No. 3 B & S & No. 4 Cin.
Profiler, #13 P. & W., B.D.
Shapers, 16"-20"-24"-36".
Shaper, 36" Morton Draw Cut.

West Penn Machinery Company
120 House Bldg. Pittsburgh, Pa.

SHEET METAL MACHINERY

NEW and USED—Hand and Power Brakes, Shears, Forming Rolls, Folders, Punches, Rotary Machines, Stakes, Spot and Arc Welders.

B. D. BROOKS, INC.
361 Atlantic Ave., Boston, Mass.

1—No. 2 Cinn. Ctrless. Grinder, M.D. late type.
10—No. 00G B & S Automatics, high speed.
3—Model B Davenport Automatics.

D. E. DONY MACHINERY CO.
47 Laurelton Road, Rochester 9, N. Y.

REYNOLDS MACHINERY SPECIALS

•

Footburt 1½" Cap. Single Spindle Automatic Screw Machine, late type.

Pratt & Whitney 6 x 20 Thread Millers, model LB.

U. S. ‡MM1 Multimillers 21x6" table, each $300.

Norton 6x18 Plain Cylindrical grinder, new 1945.

Grenby ‡EG10 Cylindrical Grinder.

Heald ‡25A Rotary Surface Grinder, 30" Magnetic Chuck. Late type.

Abrasive ‡5 Surface Grinder, 48x14x14. New 1940.

Farracute ‡EG54, 400 ton knuckle joint Power Press.

•

REYNOLDS MACHINERY CO.

303 EDDY STREET
PROVIDENCE 3, R. I.
Tel. GAspee 5187

LATE TYPE TOOLS

36" Bullard Spiral Drive, 1943 tool
No. 2MH Cincl. Univ. Miller, 1944
No. 2H K. & T. Univ. Miller, 1944, slotting & vert. attach. & rotary table.
Nos. 2, 3, 4, & 5 W. & S. Univ. Turrets, late
22"x96" centers Monarch, new 1944
30"x23' centers, 42"x17' centers, 48"x18' centers, & 60"x15' centers Niles Lathes, all new 1942
28/50"x14' Rahn-Larmon Gap Lathe, T. A.
No. 48H Gould & Eberhardt Gear Hobbers, 1941
12" Gleason Gear Generators, 1943 (3)
6' Foedick Radial, 19" col., 1943.

BENNETT MACHINERY CO.
30 Church St. New York 7, N. Y.

HEADLINERS

LATHES

14"x6' HENDEY Grd. Hd., AC MD, taper
14"x6' AMERICAN 12-spd. Grd. Hd., AC MD, taper
14"x6' HENDEY Type ECM, AC MD, taper
14"x6' MONARCH Schulte AC drive
14"x6' HENDEY, Schulte AC MD, univ. relieving attach.
14"x6' HENDEY, 4 SCD, BG, QC
14"x8' AMERICAN 12-spd. Grd. Hd., taper
14"x8' LeBLOND Gap, self-cont. AC MD
16"x6' SEBASTIAN Grd. Hd., AC MD, Timken, taper, new 1942
16"x6' LODGE & SHIPLEY, 3 SCD DBG
16"x6' AMERICAN, 3 SCD, DBG
16"x6' SIDNEY Gard. Hd., AC MD
16"x8' HENDEY, self-cont. AC MD, taper
16"x8' HENDEY Type ECM, AC MD, taper
16"x8' CINCINNATI, 3 SCD DBG
16"x8' WALCOTT, 3 SCD DBG
16"x8' LODGE & SHIPLEY 12-spd. Selec. Grd. Hd., AC MD, taper
16"x84" ctrs PRATT & WHITNEY Model B Tool Room, AC MD, taper, etc.
16"x12' LODGE & SHIPLEY 12-spd. Selec. Grd. Hd., AC MD, taper
17"x8' SIDNEY, self-cont. AC MD, taper
18"x8' LEBLOND, 3 SCD DBG
20"x6' SEBASTIAN Model "R" Grd. Hd., AC MD, new 1947
20"x8' HENDEY Grd. Hd., AC MD
20"x8' AMERICAN, 3 SCD DBG
20"x8' LODGE & SHIPLEY 12-spd. Grd. Hd., SPD
20"x8' LODGE & SHIPLEY 12-spd Selec. Grd. Hd., AC MD, taper
20"x10' AMERICAN 8-speed Grd. Hd., AC MD, taper
20"x12' LODGE & SHIPLEY, self-cont. AC MD
20"x12' MONARCH, 3 SCD DBG
20"16' BRADFORD 5 SCD DG
24"x12' AMERICAN 8-spd. Grd. Hd., AC MD
24"x12' BOYE & EMMES, self-cont. AC MD
24"x14' LODGE & SHIPLEY, self-cont. AC MD, taper
27"x10' GREAVES-KLUSMAN, 3 SCD DBG
36"x20' LODGE & SHIPLEY 18-spd. Selec. Grd. Hd., MD, taper

MILLERS

#0½ LEBLOND Pl., cone
#1 CINCINNATI Univ., 4 SCD, BG, div. hds.
#1-A MILWAUKEE Pl., DOA, SPD
#1-M CINCINNATI Rect. O.A. Pl., SPD
#2 CINCINNATI H.P. Pl., AC MD
#2-M CINCINNATI Rect. O.A. Pl., AC MIB, Timken
#3 CINCINNATI Pl., 3 SCD DBG
#3-B BROWN & SHARPE Pl., DOA, AC MIB, PRT, #50 spdle.
#42 OHIO Pl., Lima AC MD, PRT
#4-B Heavy BROWN & SHARPE Pl., AC MD
#4-B MILWAUKEE Pl., arr. MD, DOA, PRT
#4-B BROWN & SHARPE Pl., AC MIB, DOA, #50 spdle. INDEX Vert., AC MD, PF to table
#14 COCHRANE-BLY Duplex Univ. Vert. & Shaper, AC MD
#2 CINCINNATI H.P. Vert., SPD
#2½B MILWAUKEE Vert., SPD, 16" PF rot. table
#4 CINCINNATI Vert.
6"x48" PRATT & WHITNEY Thread, AC MD
#6 LEES-BRADNER Thread, arr. MD
4" PRATT & WHITNEY Spline, arr. MD
#1 TOLEDO Hand, AC MD
#2 KENT OWENS Hand, AC MD, Timken, #50 spdle.

SHAPERS & PLANERS

14" GOULD & EBERHARDT H.D., 4 SCD, BG
16" GOULD & EBERHARDT H.D., 4 SCD, BG
16" AMERICAN, Self-cont. AC MD, univ. table
20" GOULD & EBERHARDT H.D., Lima AC MD
20" HENDEY, Lima AC MD
24" CINCINNATI V-Ram Univ., AC MD
28" AMERICAN Heavy Duty, arr. MD
24"x24"x6' CINCINNATI, AC MD
36"x36"x8' GRAY, AC MD
36"x36"x16' GRAY, AC MD, 4 hds.
42"x42"x10' LIBERTY Openside, AC MD, 2 hds., aux. table
42"x42"x12' LIBERTY Openside, AC belted MD, 3 hds.

DRILL PRESSES

#3 AVEY 2-spdle., arr. MD
21" CINCINNATI Slid Hd., AC MD
24" CINCINNATI Slid Hd., AC MD
24" MECHANICS Slid Hd., AC MD

RADIAL DRILLS

3' FOSDICK, belt
3' AMERICAN Trip Purp., AC MD
3' DRESES, MD
4' MORRIS, MD
6' CINCINNATI-BICKFORD, MD
6' CINCINNATI-BICKFORD, MD, 2' extra height to col.
7' DRESES, AC MD
3' CANEDY-OTTO, AC MD, new 1943

GRINDERS

#2 BROWN & SHARPE Univ., Factory AC MD
10"x30" WEBSTER & PERKS Univ., belt
#22 HEALD Rotary, AC MD
K.O. Lee Surface, AC MD
#3 ABRASIVE Surface, AC MD
#72A-2 HEALD "Sizematic" AC MD
12"x72" LANDIS Plain Self-Cont., AC MD
#51 OLIVER Drill, AC MD
#16 BLANCHARD Vert. Spdle., AC MD
#4 GARDNER B.B. Disc Grinder, 23", AC MD, new in 1942

GEAR MACHINERY

#1 ADAMS Hobbers, arr. MD
#34 BROWN & SHARPE Hobber, AC MD
#61 FELLOWS Shapers, AC MD
#12 BARBER-COLMAN Hobbers, SPD

TURRET LATHES

#4 WARNER & SWASEY Univ., Timken, AC MIB
#4 WARNER & SWASEY, 3 SCD, bar feed
#3A WARNER & SWASEY Univ., arr. MD in leg, 2' longer bed
#2B FOSTER Univ. Grd. Hd., SPD
#3 ACME Univ., AC MD

MISCELLANEOUS

#2 BROWN & SHARPE Automatic
3¼" bar MORRIS Horz. Boring Mill, AC MD
#0 LAPOINTE BROACH, AC MD
#0 BAKER Keyseater
2" LANDIS Pipe Machine, cone
8" COX Pipe Machine
1" ACME Class A Bolt Threader, cone
2½" ACME Class A Bolt Threader, cone RELIEVING Machine
#2A HIGH SPEED Riveter, AC MD
#2X GARVIN Tapper, AC MD
10" PRATT & WHITNEY Vert. Shaper, cone
14" BETTS Slotter, AC MD

‡8-DT POTTER & JOHNSTON Automatic Chucking & Turning Machine, AC MD, new in 1943, excellent condition.

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Three minutes from the Cincinnati hotel district

MACHINE TOOLS—*Subject to Prior Sale*

DRILLS

3'11" CANEDY-OTTO — RADIAL — 220/3/60/1800 — LATE TYPE — 1942 Mfg.

3'9" AVEY — Sensitive — RADIAL — Belt Drive.

GRINDERS

10"x24" LANDIS — Universal — Hyd. — 220/3/60 — Type C — 1944 Mfg. — Used 3 months.

#2 CINCINNATI — Tool & Cutter — 220/440/3/60 — Universal — Large assortment of accessories — LATE TYPE.

7"x11" LEACH — Plain Cylindrical — M.D. — 220/3/60 LATE TYPE — 1942 Mfg.

6"x18" MONARCH — Surface — Hand feed — XLO mtzd. Spdle — 550/3/60 — with chuck.

#60 HEALD — Cylinder.

10"x14" MAJESTIC — Cylindrical — 220/3/60 — mtzd. work head — mtzd. wheel head pump — piping — LATE TYPE — 1943 Mfg.

10"x24" NORTON — Cam Grinder — Mtzd.

#13 BROWN & SHARPE — Universal — Tool & Cutter — Wet. attachment — Cabinet — Lg. assort. of access. — LATE TYPE — 1942 Mfg.

6"x32" NORTON — Plain Cylindrical — MD — 220/440/3/60.

#70 HEALD — Internal — 220/3/60 — MD.

LATHES & TURRETS

20"x54" REED-PRENTICE — 16 speed — Geared Head — Taper Attach. — 220/440/3 — with additional equipment — LATE TYPE — 1942 Mfg.

14"x30" LODGE & SHIPLEY — 12 speed — motor in base — TA — chuck — stops — 4 way tool post — 220/440 — other equipment — 1941 Mfg.

14"x6' HENDEY — Geared head — factory MD — chucks — less mtr.

16"x6' HENDEY — QCG — Taper attashment — Chuck — Collets — MD.

#5 JONES & LAMSON — Universal Turret — LATE TYPE — 1943 Mfg.

#2 WARNER & SWASEY — PF to turret— Cross slide — BD — arr. MD.

14x8' Monarch — Engine — BG — Chuck, collets, motorized, Turner drive

MILLING MACHINES

#3K K&T "Milwaukee" Plain Horizontal — Power rapid traverse — 220/440/3/60 — motor in base — LATE TYPE — 1943 Mfg.

#3H K&T "Milwaukee" Plain Horizontal — Power rapid traverse — 220/440/3/60 — motor in base — LATE TYPE — 1942 Mfg.

#2K K&T "Milwaukee" Plain Horizontal — Power rapid traverse — 220/440/3/60 — motor in base — LATE TYPE — 1943 Mfg.

#34 OHIO — "Osterlein" — Universal — Belt drive — New dividing heads.

#2—24 CINCINNATI — Rise and fall — LATE TYPE — 1942 Mfg.

#3H K&T "Milwaukee"" — VERTICAL — Power rapid traverse — Powder feed to head — Motor in base — LATE TYPE — 1942 Mfg.

#2H K&T "Milwaukee" — VERTICAL — Power rapid traverse — Power feed to head — Motor in base — LATE TYPE — 1942 Mfg.

#5 BECKER — Vertical — Belt drive — Motor bracket — 12x48" table.

#1 United States — Hand — complete 220/440 late type — 1942 Mfg.

PRESSES

DP53 FERRACUTE — 40 ton — SS — Motor driven — 220/3/60 — Plain — With side shear — 1940 Mfg.

#3K PERKINS — Screw — NEW.

SAWS

#4C COCHRANE-BLY — Cold — inserted tooth blade — MD — 220/3/60.

SCREW MACHINES

#0G BROWN & SHARPE — Fully automatic — Vertical slide attachment — Serial No. 7500.

#00G BROWN & SHARPE — Fully automatic — Serial No. over 11,000 — Motor driven slotting attachment — Swing step and equipment — LATE TYPE.

#R4 NATIONAL ACME — 4 spdle — Fully automatic — 3⅛" cap. — 220/440/3/60 — complete assortment of equipment — LATE TYPE.

#0 BROWN & SHARPE — Fully automatic — Belt drive.

#R NATIONAL ACME — 4 spdle — Fully automatic — 1⅜" cap. — LATE TYPE — Extra equipment.

2" GREENLEE — 6 spdle — Fully automatic — Motor driven — LATE TYPE — 1942 Mfg.

SHAPERS

10" GEMCO — "Lubigard" — 220/3/60 — Power rapid traverse — Heavy duty — NEW.

28" AMERICAN — Back geared — Power feed to head — Single pulley drive.

32" GOULD & EBERHARDT — Universal — "Industrial" — Heavy Duty — Late Type — Mfg. 1942.

24" GOULD & EBERHARDT — Crank — Motorized with 4 speed drive.

7" LOGAN — Floor type — 110/1/60 — NEW.

16" Stockbridge Crank backgeared CD — with vise

SHEARS

36" PEXTO—Power squaring—Motor drive—16 ga.

42" WHITNEY — Power squaring motor drive — 220/3/60 — 16 gauge — NEW.

MISCELLANEOUS

DIE FILER — Harvey "Butterfly" — Model EL — 110/1/60 — LIKE NEW.

PLANER — Woodward & Powell — 30"x30"x12' — 2 rail heads — 2 side heads — Down feed and elevation — Box bed — BD.

PLANER — Whitcomb — 24"x24"x6' — Arr. for motor drive — Less elec. equip. — 1 rail head.

PUNCH & SHEAR — Williams & White — #11

HAMMER — Bliss — 300# — Board drop.

CLUTCH CUTTERS — Waltham.

PROFILER — Pratt & Whitney — #13 — Gear driven.

Boring Mill — Universal — 3" bar — horizontal — MD — 220/3/60.

SUPERFINISHER — Foster.

GEAR CUTTER — Brown & Sharpe — #6 — 72" spur.

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	Dia. Body	*Dia. Drill*	*Length Overall*
SIZE C-2	13/64"	1/16"	1⅞"
SIZE D-1	15/64"	5/64"	2"
SIZE E-1	3/10"	3/32"	2⅛"
SIZE E-2	3/10"	⅛"	2⅛"
SIZE F-1	7/16"	5/32"	2¾"
SIZE F-2	7/16"	3/16"	2¾"
SIZE J-1	1/2"	7/32"	3"
SIZE J-2	1/2"	9/32"	3"

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CAnal 6-5575

VERTICAL BORING MILLS

100" Niles-Bement-Pond; 2 heads; PRT; MD
42" & 62" King; 2 heads; PRT; MD
36" Bullard New Era Vert. Turret Lathe
36"-44" Niles-Bement-Pond Vert. Tur. Lathe

GRINDERS

17"x28"-40" Norton Double Head Crankpin
10"x24" Norton Plain; MD
6"x18" Norton Model C Hydraulic; MD
#25A Heald; 16" & 30" chucks; MD
72A3 Heald Internal; MD
14" Pratt & Whitney Model "B"; MD
#5 Abrasive Vertical Surface; MD
#44 Ex-Cell-O Double End Carbide; MD
8"x48" Jones & Lamson Thread; MD

TURRET LATHES

#2A, 1, 2, 4 & 6 Warner & Swasey; MD
#3 Gisholt Universal; MD
#5 Foster Univ.; MD—#6 Brown & Sharpe

LATHES

24"x12' Milwaukee; MD—12"x5' Hendy; MD
18"x10' American; MD—20"x8' Springfield
14"-20"x8' Seneca Falls Gap; MD

MILLING MACHINES

#4, 3 & 2M Cincinnati Vertical; MD
#4 & 3 Kearney & Trecker Vertical; MD
#3 & 4 Cincinnati Rectangular Overarm
#4 & 3 Cincinnati Plain; MD
#3B Kearney & Trecker Universal; MD
#3B Kearney & Trecker Plain; MD
#2A Brown & Sharpe Universal; MD
#4—36" Cincinnati Hydromatic; MD

SCREW MACHINES

#2G Brown & Sharpe Automatics; MD
1⅜" Gridley Model "G" 4-spindle; MD

MISCELLANEOUS

CRANE Traveling: 10-ton Niles Cab Type; A.C. Motor Drive; 37'-9¾" span
DRILL Radial: 6-ft. Cinn.-Bickford; MD
PLANER Openside: 72"x72"x16' Cleveland; 2 rail heads; 1 side head; Revers. MD
SHAPERS: 24" Gould & Eberhardt—28" Ohio
SHAPER Vertical: 10" Pratt & Whitney; MD

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Used 7 to 10 ft. Betts Vertical Boring Mill, Belt drive, two swivel heads, swing 126", maximum height under tool holder 58". *Now in service. Inspection invited. Write*

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NEWTON COLD SAW 32"

Capacity 12" diameters. 2 Motors Variable Speeds, Q. C., 3/60/220-440 Feed Table. Wt. 8500 lbs. *Latest Model.*

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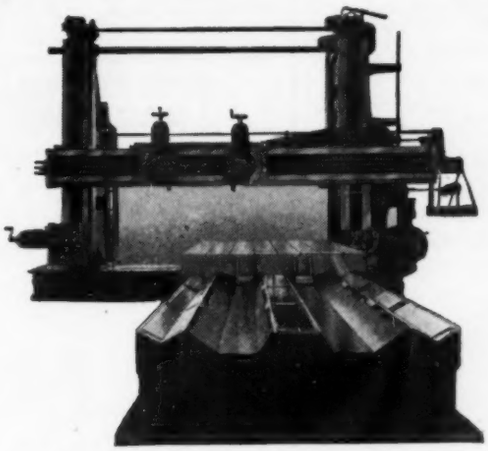
OPENSIDE

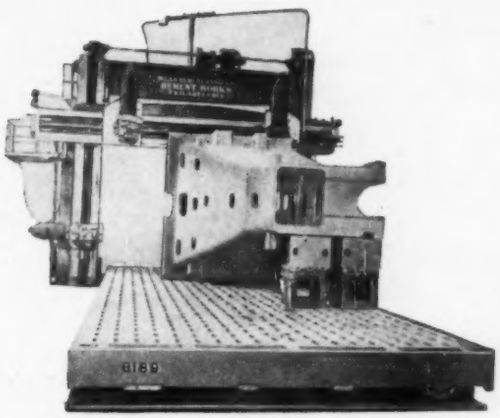
8'6"/15'9"—6"x35' Detrick & Harvey Convertible Openside, double deck, 3 ways, 100 HP, DC
60"x60"x16' Cleveland Openside, 2 heads, AC or DC self-enclosed drive
48"x42"x12' Detrick & Harvey Openside, 2 heads, AC or DC self-contained drive

DOUBLE HOUSING

16'x12'—9"x35' N-B-P Heavy, Variable Voltage Drive, 4 heads, 125 HP AC
10'x10'x20' N-B-P Heavy, 4 heads, forced feed lubrication, 50 HP DC
72"x72"x18' N-B-P Heavy, 4 heads, P.R.T. 230 V. DC
60"x60"x20' N-B-P Heavy, 4 heads, 230 V DC
48"x48"x32' G.A. Gray Spiral Geared, 4 heads, 230 V DC
48"x48"x24' N-B-P, 3 heads, 230 V DC
48"x48"x18' Detrick & Harvey Heavy, 4 heads, 230 V DC
42"x42"x12' N-B-P, 4 heads, 230 V DC
36"x36"x14' G.A. Gray, 3 speed, 4 heads, self-contained M.D. AC or DC
30"x30"x10' Cincinnati, 2 heads, self contained M.D. AC or DC
No. 3 Hilles & Jones 30'x1½" Plate Planer, ten pneumatic jacks, AC or DC



8' 0"/15'x9'-6"x35' Detrick & Harvey Convertible Openside, 4 heads, 3 ways, 100 HP, 230 Volt DC Planer motor and control station



10'x12'—9"x35' N-B-P Variable Voltage Drive, 4 heads, 75 HP main drive motor with 75 KW motor generator set driven by 125 HP, 220/440 V. AC motor and controls

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LATHES

10"x20" MONARCH Toolmakers, 1943
12"x30" MONARCH Toolroom, 1942
12"x30" HENDEY Toolroom, 1941
14"x10' HENDEY Yoke Head, complete tool room equipment, 84" centers
16"x10' HENDEY Yoke head, complete tool room equipment, 80" centers
18"x10' LODGE & SHIPLEY, 12 speed selective geared head, taper attachment, A.C.—M.D. (2)
19"x12' SIDNEY, Q.C.G. motorized, 100" centers
20"x12' LODGE & SHIPLEY 12 speed selective geared head, taper attachment, A.C.—M.D.
24"x16' AMERICAN 8 speed head, taper, M.D.
25"x16' AXELSON Heavy Duty 10' centers, complete equipment, practically new, 1943
36"x11' centers POND 15HP, M.D.

TURRET LATHES

#4 WARNER & SWASEY Universal Turret Lathe, Preselector head, A.C.—M.D.—1941
#4 GISHOLT, Timken spindle, bar feed, M.D.
#2A WARNER & SWASEY, Timken Spindle, Bar feed, M.D.
#4A WARNER & SWASEY, 7½" Bar capacity, bar feed and electric chuck, M.D.

RADIAL DRILLS

2½'-7" Column AMERICAN Triple Purpose, A.C. —M.D.
3'-9" Column CINCINNATI BICKFORD, 32 speed head, gear box on base
3'-9" Column AMERICAN, gear box on base
3½'-9" MORRIS, gear box on base
3'-9" CINCINNATI BICKFORD, Mtor on base
4'-11" AMERICAN Triple Purpose, A.C.—M.D. (2)

LATE TYPE TOOLS

36"/120" CINCINNATI Horizontal Hydrotel Milling Machine, depth control 360°, profiling unit
#33A SUNDSTRAND DUPLEX Milling Machine, Table 22x72, A.C.—M.D., 1943
10"x20" MONARCH "EE" Toolmakers Lathe
12"x30" MONARCH Toolroom Lathe
12"x30" HENDEY Toolroom lathe
25"x16' AXELSON Heavy Duty Lathe, practically new
No. 4 WARNER & SWASEY, A.C.—M.D. Turret
No. 2K KEARNEY & TRECKER Vertical, A.C.—M.D.
No. 6G SELLERS Drill Grinder
No. 30A FOSDICK Jig Borer
No. 2G BROWN & SHARPE Automatic
No. 00G BROWN & SHARPE Automatic
9A MARVEL Power Hacksaws, 10"x10" with stock feed (2)

6'-15" Column CINCINNATI BICKFORD, semi enclosed head, M.D.
8'-17" AMERICAN, D.C. Motor on Arm

MILLING MACHINES

No. 1 KEMPSMITH, Universal
No. 2K KEARNEY & TRECKER Vertical, 1943
No. 3 CINCINNATI, Universal, Motorized
No. 4 CINCINNATI, Plain, G.H.
#33A SUNDSTRAND DUPLEX MILLING MACHINE, table 22x72, A.C.—M.D.—1943
36"/120" CINCINNATI Horizontal Hydrotel Milling Machine, depth control 360°, profiling unit, 1943

DRILLS

24" AURORA Sliding head, geared feeds, A.C.—M.D.
6 Spindle ALLEN, A.C., M.D.
22" BARNES, self-oiling, 2 spindle drill
No. 8D MINSTER, Box column, compound table, No. 6 M.T., A.C.—M.D.
No. 30 NATCO, 34 spindles, A.C.—M.D.

BORING MILLS

24" BULLARD, New Era Type, M.D.
53" NILES BEMENT POND, P.R.T., M.D.
No. 45 GIDDINGS & LEWIS, horizontal, 5" bar, A.C.—M.D.
No. 2I LUCAS Horizontal, A.C.—M.D.
#30 UNIVERSAL TRIWAY, Timken Spindle, 3" bar, M.D.

PLANERS, SHAPERS AND SLOTTERS

36" widened to 48"x10' GRAY 3 heads, A.C.—M.D.
24"x24"x6' WHITCOMB
36"x36"x12' POWELL, 2 heads, M.D.
24" KELLY, crank shaper, motorized
24" BETTS, vertical slotter, M.D.

MISCELLANEOUS

No. 2 DAVIS Keyseater
#2 BAKER Keyseater, M.D.
No. 2G BROWN & SHARPE Automatic Screw Machine, M.D.—Serial 6200
No. 5½ ROCHESTER, Hi speed Hammer, M.D.
1½" WILLIAMS, Bolt Cutter, double head, Landis Heads, M.D.
No. 3 Abrasive Surface Grinder
6' & 8' Hand Bending Brakes, 14 ga. (new)
#2 BAKER Keyseater, M.D.
Model BL 2416 KELLER Duplicating Machine
36"—18 ga.—to 120"—10 ga. SQUARING SHEARS —(new)

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36", 42" & 54" BULLARD Vert., M.D. Spiral Drive
#360-F GIDDINGS & LEWIS, Floor Type M.D.
#560-F GIDDINGS & LEWIS, Floor Type, M.D.
#44 UNIVERSAL Tri-Way, Table Type

GRINDERS

#2 B&S and REID Surface, M.D.
A3-16" ARTER Rotary Surface Grinder
#10 B&S Tool & Cutter, M.D.
#72A3 HEALD Plain & Sizematic, M.D.
#4T SELLERS Tool Grinder, M.D.
9" P&W Hyd. Gear Grinder, M.D.
#11 BLANCHARD Rotary, 16" chuck
4—#4H LANDIS 4"x18" Plain Grinders, M.D. with hyd. straight infeed, hyd. timer & hyd. footstock
6"x18" NORTON & LANDIS Type C Plain
6"x30" NORTON Type C Plain Cyl.
14"x36" LANDIS Type C, Plain
24"x96" NORTON Plain, M.D.

LATHES

AMES Precision Bench Lathe, 1" collet cap., M.D.
12"x6' LODGE & SHIPLEY G.H. Lathe
14"x30" c.c. LEBLOND HVY DUTY, M.D.
16"x54" c.c. LEBLOND HVY DUTY, M.D.
16"x6' SEBASTIAN LATHE, M.D.
50"x17' c.c. LEBLOND "BIG SWING" Lathe, M.D.

MILLING MACHINES

#5/60 CINCINNATI Duplex Hydromatic Milling Machine, tracer control mechanism for automatic rise and fall of spindle carriers, M.D. machine used six months.
#08 CINCINNATI Hor. & Vert. Millers
#12B&S Prod. Mills, M.D.
#2—24 CINCINNATI Auto. Millers
1224 K&T Simplex, M.D.
#1G & 2G KEMPSMITH All Geared Univ. M.D.
#12 VAN NORMAN Universal Miller, M.D.
#2H K&T Vertical, Power Feed, M.D. (3)
#2MS CINCINNATI Dial Type, Plain, M.D.
#4MS CINCINNATI Dial Type Plain M.D. (2)
#4K K&T Plain, M.D.
#M-50A TAYLOR & FENN Vert., M.D.
#12M MOREY 2-spdle Profiler, M.D.
#12B P&W 2-spdle PROFILERS, M.D.

TURRET LATHES

#0 B&W Wire Feed Screw Machines, M.D.
#2G MOREY Ram Type, M.D.
#3 GISHOLT Ram Type Univ., M.D.
Nos. 3, 4, & 5 W&S Ram Type Univ., M.D.
Nos. 3 & 5 J&L Ram Type Univ., M.D.
#4A W&S Saddle Type Univ., M.D.

DRILLS

6-spdle ALLEN Drill, 5 powerfeed spindles
3'9" CINCINNATI BICKFORD "Super Service" Radial

MISCELLANEOUS

#36H GOULD & EBERHARDT Gear Hobber
Used Bases for 4' & 6' CINCINNATI BICKFORD Radials
#4—48" B&S Gear Cutter
40"x32"x51" OHIO Tilting & Revolving Rotary Table for Horizontal Boring Mill
14" STEPTOE Shaper, V-belt, M.D.
V-16 DOALL Contour Saw, M.D.

EXCEPTIONAL MACHINES

#360-F & #560-F GIDDINGS & LEWIS Hor. Boring Mills, Floor Type, (1942)
14" x 30" c.c. LeBLOND Toolroom Lathe, 1943
16" x 54" c.c. LeBLOND Toolroom Lathe, 1943
50" x 17' c.c. LeBLOND "Big Swing" Lathe, 1942
#5/60 CINCINNATI Duplex Hydromatic Miller, 1943
#36-H GOULD & EBERHARDT Hobber, 1942

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LATE TYPE MACHINE TOOLS

Monarch, Model N, 24"x130" centers Lathe, 1944-1945 model with 3-phase, 60 cycle, 220 volt AC motor, Taper Attachment, Chuck, Pan Bed, Pump and Piping. All standard equipment. Guaranteed like new.

Lodge & Shipley 18"x48" Geared Head Heavy Duty Engine Lathe, quick change gear, pan bed, standard equipment, chuck, motor driven.

Brown and Sharpe #3B Plain Milling Machine, Double Overarm, slotted nose, quick change feeds and speeds, power feed in all directions, force feed lubrication, size of table overall, 14"x60"; Motor in base with 7½" HP AC Motor, 3/60/220, Push button control and arbor.

2—#4 Warner & Swasey Universal Turret Lathe, Pre Selector Geared Head, lubrication, Timken Bearing, Ram Type, force feed, Motor in base, with 5 HP AC Motor 3/60/220-440, push button control, wire feed, collets, pump & turret attachments, built 1941.

Blanchard #16 Vertical Grinder, 30" Magnetic Table, motor driven.

American 4' 13" column, Box Head Radial Drill, motor driven.

Gisholt #4 Turret Lathe, motor driven, bar feed with standard equipment.

Blanchard No. 18 Grinder, with 30" magnetic chuck. Motors are 550 volt, 3-phase, 60 cycle. Latest model.

2—Norton 6"x18" Model C, Semi-automatic Cylindrical Grinders, standard equipment, motor driven.

Con-o-matic 6-spindle Screw Machine, 2" capacity, 1943-44 model. Fully equipped.

Brown & Sharpe #2G automatic Screw Machine, magazine feed, motor driven.

2—Marvel #8 Universal Metal Cutting Band Saws, motor driven.

465-471 ATLANTIC AVE. HA-6-6460 BOSTON 10, MASS.

14"x48"x20' Gray Planers (2) 4 heads, DC Motor Drive
BLISS: #6 Hor. Header Presses
"IXL" Sheet Rolling Mill, 24" rolls, 75 HP AC Motor drive
Turret Lathes: W&S 1A: 2A: Libby 3½" Bar, Foster: Denver Acme
Flash Welder, Swift 200 KVA
Resistance Spot Welder, Thomson Gibb 40 KVA
Roll Forming Machine Farnham 12' long
Thread Mills, Lees Bradner Model CT, 13" Spindle
#412 New Britain Gridley Aut. Chuckers—4 sp.
Southwark Hor. Hyd. Draw Rolls
Shaper 18" American
P&W #1, Hor. Deep Hole Drill, 2 sp.

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MILLER

1—8D Gorton Vertical Miller, complete with duplicating table #520-1, tracer head #599-2, Serial #13585, 2 speed AC motor, 220 volts, 3 phase, 60 cycle. Write Mr. Armstrong of ANDERSON & SONS, INC., WESTFIELD, MASS. for the particulars.

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- June, 1947, auctioned factories for $3,200,000!
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Milling Machines—#1, Universal, #1 American (new) plain, #1 Vertical.

Drills—Large selection, single and multiple spindles also bench types, many of them new.

Gear Cutters—Brown & Sharpe #3—26", Gould & Eberhardt 42".

Grinders—Cylinder B & S #11, Planer type 16"x36", Surface 13"x62", also new (small) Universal bench and floor type. All with coolant, motorized.

Lathes—14"x6' 8', 10'—16"x6', 8', 10'—18"x6', 8', 10'—26"x16'—all cone drive, several motorized also (new) 18"x8' and 10' geared head, motorized.

Large stock 19" and 12" bench and floor type.

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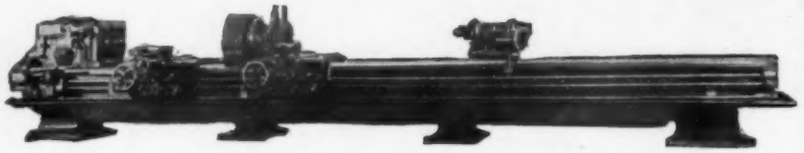

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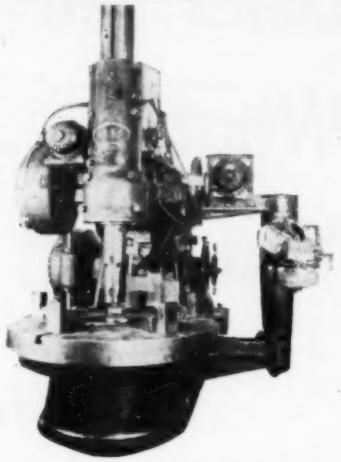

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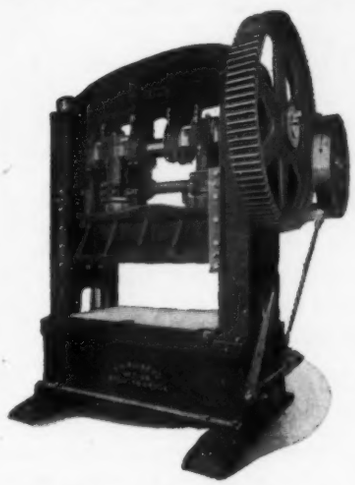

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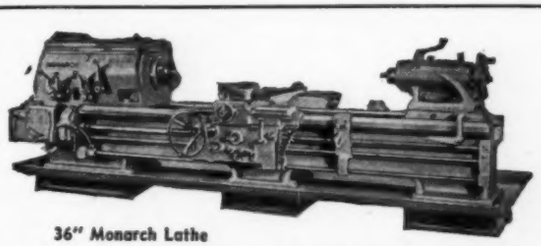

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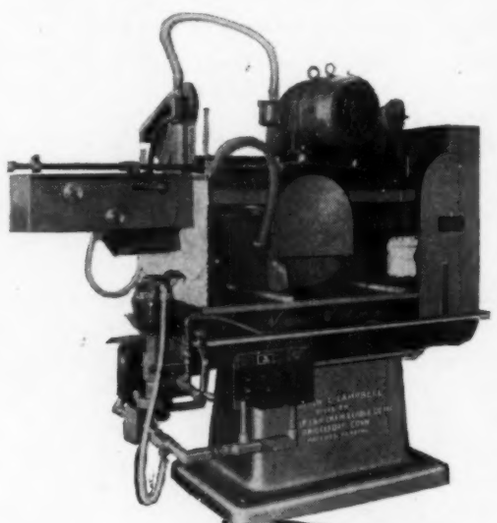

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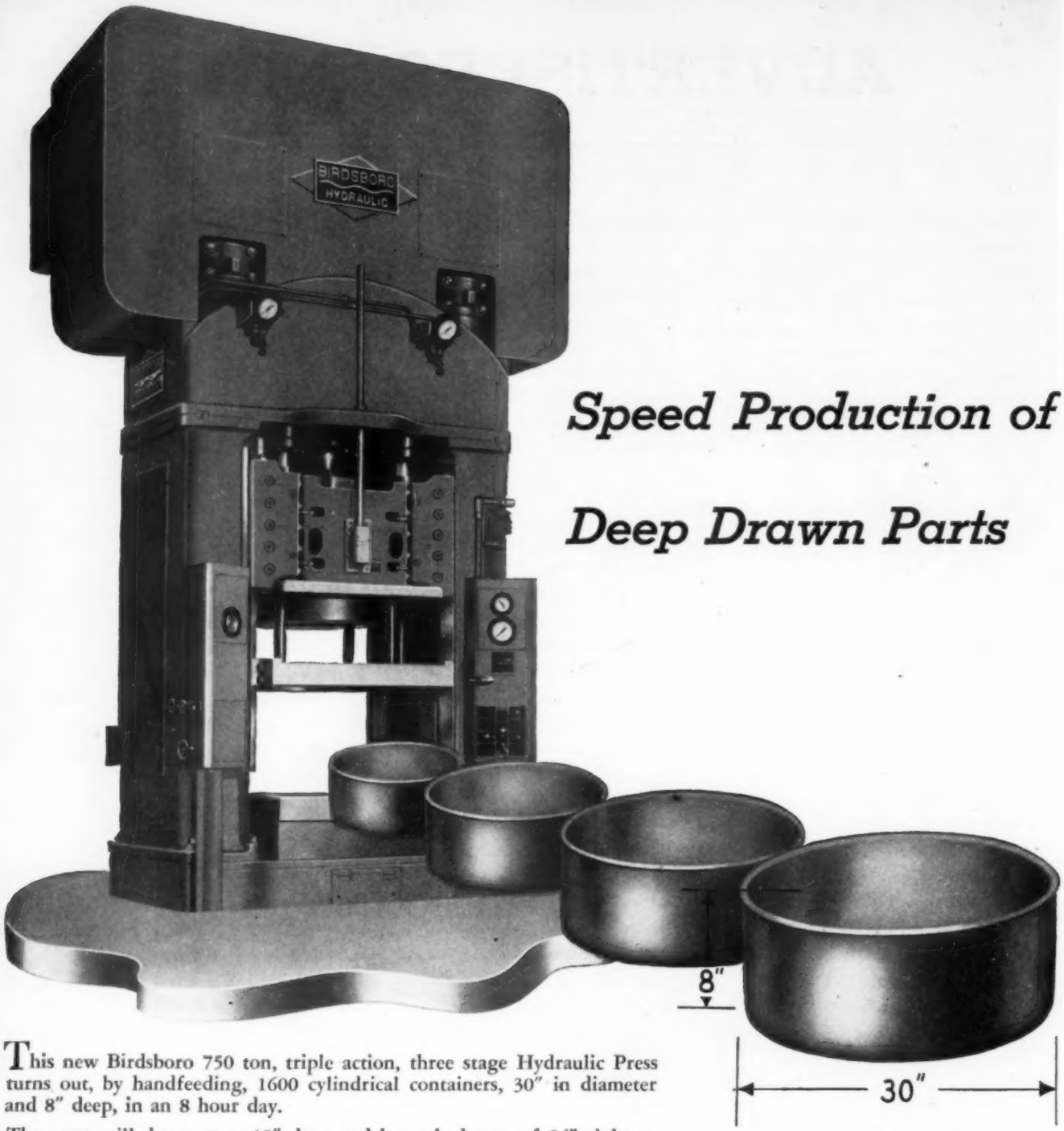

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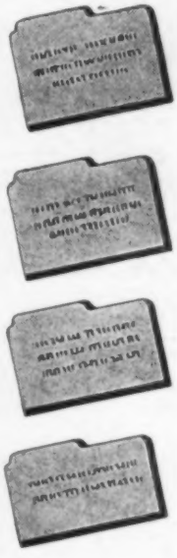
IF YOU'RE SCRATCHING AROUND FOR A WAY TO LOWER OPERATING COSTS...

Dollar for Dollar OIL PURIFICATION Will Pay Highest Return on the Money You Invest



I would like to see performance records on oil purification for:

☐ Internal Combustion Engines, Lubricating Oil. (Polymer Corporation, Ltd., Sarnia, Ontario, Canada. Manufacturers of synthetic rubber and rubber products.)

☐ Machine Tool Soluble Oil Coolant (Ford Motor Company, Detroit, Mich. Motor Building Plant—precision motor parts.)

☐ Cutting Oil (Wagner Electric Corporation, St. Louis, Mo. Manufacturers of electric motors and parts, transformers, industrial and automotive hydraulic brakes, etc.)

Please send me data on *oil purification*

for_____

operations. (fill in)

NAME_____

COMPANY_____

ADDRESS_____

CITY AND STATE_____

HONAN-CRANE CORPORATION

205 Wabash Avenue Lebanon, Indiana

Your company will spend money—invest certain operating capital—in new equipment, processes, production and maintenance aids designed to reduce operating costs.

You will have a vote in the selection of the equipment or service for which that investment is to be made.

Let us show you, by actual records and data compiled by well-known manufacturers, the truth of our statement that "Dollar for dollar, effective oil purification pays you the highest return on the money you invest." Please fill out and mail the coupon.

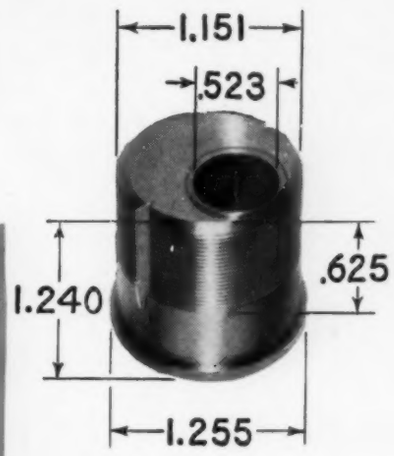
A SUBSIDIARY OF

HOUDAILLE-HERSHEY CORPORATION

NEW BRITAIN AUTOMATICS LOWER BREAK-EVEN POINT ON THIS PIECE . . .

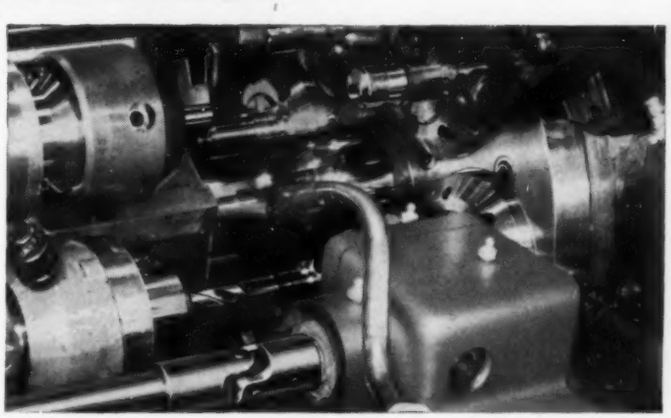
By

Eliminating 2nd operations
Reducing time and labor costs
Increasing production rate over 100%
Improving quality of product
Reducing material cost



A leading manufacturer formerly turned out the lock cylinder case illustrated from castings on five separate machines, each of which required a full time operator. Searching for more profitable production, he decided to investigate the possibility of automatic machinery.

By stopping the spindles and using eccentric drilling, plus milling attachments, New Britain engineers were able to put the entire job on one of our new model 601 Automatics using bar stock instead of costly castings. Production is maintained at 613 pieces per hour (5.8 secs. per piece), and the operator can easily take care of two other machines.



Eight operations plus cut-off are necessary to complete the piece. The spindle is stopped in the 4th position where the V slots are milled while the eccentric drilling attachment drills the main cylinder hole. Because specifications require the closest alignment between the two slots and the eccentric hole, the spindle is indexed to the 5th position without changing the alignment. In the 5th position the main cylinder hole is reamed while a cutter faces the end of the piece leaving a shoulder around the hole.

For a practical solution to mounting manufacturing costs . . . let New Britain engineers point the way to lowering the break-even point in your plant. Write today for your copy of "Cost Histories" which describes many specific approaches to more economical manufacturing.

Productivity, not price, is the measure of a machine.

NEW BRITAIN AUTOMATICS COST LESS PER FINISHED PIECE

THE NEW BRITAIN MACHINE CO.

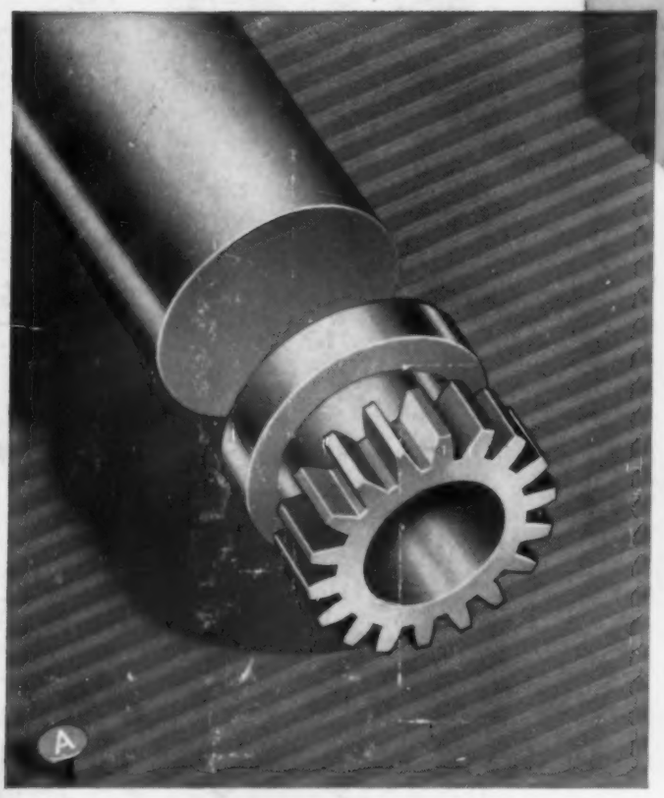
NB

NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

Which of these parts costs less to make?



WHEN you make cylindrical parts from Timken tubing, you eliminate drilling entirely. There's less stock to machine, less scrap. Finish boring is often your first production step. Parts cost less to make.

Chances are you will also get added strength for your product due to the *uniform, fine forged quality* of Timken seamless tubing. The piercing process by which Timken tubing is made is basically a forging operation. This gives the tubing a *uniform spiral grain flow* for greater product strength and a *refined grain structure* which brings out the best in the quality of the metal.

Every inch of a Timken seamless tube possesses uniform fine forged quality because it is pierced at the rate of a foot a second with no time for heat loss! And Timken's rigid quality control from melt shop through final tube inspection assures you of a uniformity from tube to tube and heat to heat that means uniform response to your machining and heat treating operations.

It's more than likely that Timken tubing can help you make a better product at lower cost. Why not let our Technical Staff help you find out? They will make an "on-the-job" analysis of your problem without obligation. Just write our Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

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Fine Alloy

STEEL

and Seamless Tubes

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.